

Report

Phase 2 Contamination Assessment for:

Properties on Loftus Cr, Knight St, Parramatta Rd and Subway Ln,
Homebush NSW

13 SEPTEMBER 2018

Prepared for:
Statewide Planning Pty Ltd
Level 2
31 Cowper Street
Parramatta NSW 2150

Project No. SES_442

Prepared/Approved by:
Mr Adam Sullivan
Site Contamination Specialist
Certified Environmental Practitioner
Certification No. SC40944



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Approval:



.....
Adam Sullivan
Principal Scientist
BSc, Cert. Env. Law
Site Contamination Specialist
Certified Environmental Practitioner
(CEnvP #SC40944)

Sullivan Environmental Sciences Pty Ltd

**PO Box 5248
Turramurra NSW 2074
Australia
E: adam@sullivan-es.com.au
T: 0400 500 264**

Date: **13 September 2018**
Reference: **SES_442**
Status: **Final**

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Executive Summary

Statewide Planning Pty Ltd (Statewide) commissioned Sullivan Environmental Sciences (Sullivan-ES) to revise and update the Phase 2 Contamination Assessment (the Phase 2) for a cluster of properties located on Loftus Crescent, Subway Lane and Parramatta Road in Homebush NSW. Since previous sampling was conducted in 2016, the subject site has been expanded to include a number of properties on the adjoining Knight Street; as such, additional investigations were needed to examine contamination risks on the additional lots.

The site is the subject of a Development Application (DA) to develop the site for mixed high-rise residential and commercial retail use. The proposed development comprises three residential flat buildings off Loftus Crescent, Parramatta Road and Knight Street with basement car parking. The proposed development also includes an upgrade and creation of a link road (called Loftus Lane) between Knight Street and Subway Lane, as well as dedicated landscaped garden areas across large parts of the site.

The objective of the Phase 2 was to characterise the soil and groundwater at the site and assess potential health risk to future site users. The scope of work included: reviewing background information, drilling and sampling of soil at 19 borehole locations, installing and sampling 4 temporary groundwater monitoring wells, chemical analysis for a suite of contaminants at a NATA accredited laboratory, and preparation of this Phase 2 report in consideration of the Guidelines for Consultants Reporting on Contaminated Sites, 2011, the State Environmental Planning Policy 55 (the SEPP55), and Schedule B2 of the National Environment Protection (Assessment of Site Contamination) Measure 2013.

Sullivan-ES make the following conclusions based on the findings of this revised Phase 2, subject to the report limitations presented in Section 9:

Site History and Conditions

- Historical aerial photos show that the site has been used for residential purposes on Loftus Crescent since circa 1930, while the Parramatta Road retail buildings have been present since the same time. The motor mechanics workshop was established at 2 Subway Lane circa 1960 while large warehouse-style buildings were located on Knight Street prior to 1943 after which residential flat buildings were constructed.
- Overall there appears to be little historical activity over the site in general that would pose significant contamination issues other than the motor mechanics/panel beaters workshop and the warehouse buildings on Knight Street prior to 1943. It is not known if the motor mechanics/panel beaters workshop was ever used as a service station in the past.
- Based on the findings of a detailed site inspection and review of site activities since 2016, it was found to be very unlikely that activities conducted on site since the previous sampling in 2016 would invalidate those test results. As such, test results from 2016 were adopted for reporting in this Phase 2.

Soils and Contamination Sources

- The site soils generally comprise shallow layers of fill material underlain by natural clays, followed by competent shale bedrock at approximately 2.0-5.0 mbgl. No perched groundwater was encountered as groundwater resides in the natural deeper clay/shale strata.
- Black granular materials in the surface fill layers was observed at a number of sampling locations indicating charcoal or ashy gravel material.
- Metal lid covers located in the forecourt parking area of the motor mechanics workshop is evidence of underground tanks being present beneath this area. The tanks will need to be removed and

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surrounding soils validated. Soil and groundwater sampling results show no detection of contaminants proximal to the tanks.

- A small concrete pit is located within the former mechanics/panel beater workshop. Once the slab has been demolished the localised soils should be inspected for signs of contamination, and if so, additional sampling would be warranted to quantify contamination risk.
- Detectable concentrations of the contaminant BaP TEQ over the human health land use criteria at sampling location BH5, SB11 and SB18 is caused by charcoal/ash gravels warranting remediation to remove human health contamination risks and unacceptable aesthetic issues within landscaped areas of the future development.
- The calculated 95% Upper Confidence Limit (UCL) of the arithmetic mean concentration for BaP TEQ was 4.59mg/kg which exceeds the adopted human health criteria of 4mg/kg, as such all surface/near surface fill material impacted with charcoal/ash gravels within proposed landscaped areas of the development poses an unacceptable risk to human and ecological health warranting remediation.
- All soils to be retained onsite under the new roadway of Loftus Lane meet the adopted human health investigation criteria for such land use under a commercial/industrial setting.
- The exception to this is the fill material at sampling location BH7 which is impacted by PAHs and attributed to the charcoal/ash gravels. The impacts are expected to be localised in the immediate area around BH7. The impacted fill material in this area will be removed regardless to construct the new Loftus Lane roadway over BH7.
- The indicative waste classification for impacted fill at BH7 is Hazardous Waste, however this is a preliminary classification based on total concentrations only. At the time of bulk earthworks and prior to removal from the site, waste classifications should be verified with leachable concentration (TCLP) results in accordance with the NSW EPA Waste Classification Guidelines, 2014.
- Fill materials to be excavated for the new car park basements can be removed offsite under an indicative waste classification as either General Solid Waste or Hazardous Waste. However, as before, these waste classifications are preliminary and based on total concentrations only. At the time of bulk earthworks and prior to removal from the site, any waste classifications must be verified with leachable concentration (TCLP) results in accordance with the NSW EPA Waste Classification Guidelines, 2014.
- Natural soils and bedrock to be excavated for the new car park basements can be removed offsite as Virgin Excavated Natural Material (VENM) as defined in Schedule 1 of the Protection of the Environment Operations Act 1997.
- Residual natural soils and rock remaining after bulk earthworks contains no elevated concentrations of contaminants and poses no risk to human health and are therefore suitable to remain on the site.

Groundwater

- Detections of contaminants (predominately metals) in groundwater is attributed to endemic urban sources given that there are unlikely to be any related contamination sources of this nature on the site.
- Detections of hydrocarbons in the groundwater is attributed to the naturally occurring longer chain petrogenic sources in the shale bedrock. The concentrations are reported below the health screening levels.
- Low level detection of contaminants in groundwater are not considered a cause for concern that would warrant further assessment or precludes use of the site for its intended use.
- Groundwater well BH6 was positioned proximal to the laundromat (potential dry-cleaning operation) on the adjoining eastern boundary. Results from BH6 show no impacts from dry cleaning chemicals

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in the groundwater. However, the low-level detection of chloroform could be residual impacts from the use of bleaches by the laundromat offsite, although this assumption has not been verified.

Recommendations

- Prepare a Remedial Action Plan (RAP) to address the identified soil contamination within proposed landscaped areas and document protocols for waste classification of soil/fill to be removed offsite. The RAP should be prepared by a suitably competent consultant specialising in contaminated land management.
- Underground tanks located in the forecourt parking area of the motor mechanics workshop are to be removed in accordance with Australian Standard methods and the soils validated in accordance with the Protection of the Environment (Underground Petroleum Storage System) Regulations 2014. The tank decommissioning works should be included with the RAP.
- Once the slab of the motor mechanics workshop has been demolished, the localised soils around the concrete sump pit should be inspected for signs of contamination, and if so, additional sampling would be warranted to quantify contamination risks particular to this area. These details should be documented in the RAP.

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Introduction

Statewide Planning Pty Ltd (Statewide) commissioned Sullivan Environmental Sciences (Sullivan-ES) to revise and update the Phase 2 Contamination Assessment (the Phase 2) for a cluster of properties located on Loftus Crescent, Subway Lane and Parramatta Road in Homebush NSW. Since previous sampling was conducted in 2016, the subject site has been expanded to include a number of properties on the adjoining Knight Street; as such, additional investigations were needed to examine contamination risks on the additional lots. The site locality is shown on Figure 1 and the site plan is shown on Figure 2 (**Appendix A**).

The site has been subject to approved demolition and clearing to make way for a new development, however a residential flat building currently remains at 11 Knight Street. The site previously contained low-density residential dwellings along Loftus Crescent, a motor mechanics/panel beaters workshop on Subway Lane, and commercial retail buildings along Parramatta Road with a rear access laneway off Knight Street.

The site is the subject of a Development Application (DA) to develop the site for mixed high-rise residential and commercial retail use. The proposed development has been altered since the previous sampling conducted in 2016 and now comprises three residential flat buildings off Loftus Crescent, Parramatta Road and Knight Street. The proposed development also includes an upgrade and creation of a link road (called Loftus Lane) between Knight Street and Subway Lane, as well as dedicated landscaped garden areas across large parts of the site.

It is understood that the development will require the majority of soil materials to be removed from beneath the site to a depth of approximately 6 metres below existing ground to accommodate basement car parking; however large areas of the site will retain soils either under Loftus Lane or dedicated landscape areas.

1.1 Objective

The overall objective of the Phase 2 was to assess the soils and groundwater for any contamination risks from historical and current land uses in consideration of the proposed land use; as well as document any changes to the site since previous sampling in 2016 that may cause a contamination risk.

1.2 Scope of Work

The scope of work was conducted in two parts, noting that the initial work was combined with a geotechnical investigation (D. Katauskas 2016).

2016 – Initial Sampling

- Reviewing and documenting background information such as aerial photographs, environmental information and published geological and soil maps.
- Preparing a health and safety plan and brief sampling work plan for all field-based work on the site.
- Mobilising to the site and conducting a detailed site inspection to document the current site conditions, the surrounding environments and perform an underground pipe survey to clear and confirm proposed borehole drilling and sampling locations.
- Coring of the concrete at proposed borehole locations to enable access of the soils for drilling.
- Drilling and sampling a total of eleven (11) boreholes across the site consisting of:
 - o Drilling of six (6) soil bores with a mechanical drilling rig to a maximum depth of 9.0 metres below ground level (mbgl) and collection of soil samples at various depths.

1 Introduction

- o Constructing temporary groundwater monitoring wells at four (4) drilled borehole locations and securing with a metal cover.
 - o Augering of five (5) soil bores with a hand auger to a maximum depth of 1.1 mbgl and collection of soil samples at various depths.
- Backfilling all soil bores with cuttings and demobilising from the site.
- Remobilising to the site after the groundwater wells had stabilised and collecting a sample of groundwater from each of the 4 monitoring wells.
- Performing laboratory analysis of collected samples of soil and groundwater including QA/QC samples.
- Preparing a Phase 2 Contamination Assessment report in consideration of the NSW EPA Guidelines for Consultants Reporting on Contaminated Sites, 1997 (the Reporting Guidelines), the State Environmental Planning Policy 55 (the SEPP55), and the National Environment Protection (Assessment of Site Contamination) Measure 2013 (the ASC NEPM 2013).

2018 – Additional Investigations

- Reviewing historical aerial photographs of the Knight Street properties.
- Updating the safety and sampling work plan for all field-based work on the site.
- Conducting a detailed site inspection to document current site conditions, surrounding environments and any environmental impediments to the development proposal.
- Surveying underground services using Dial-Before-You-Dig service plans to confirm proposed borehole drilling and sampling locations.
- Drilling and sampling a total of eight (8) boreholes using a hand auger in unsealed locations on the Knight Street properties to a maximum depth of 1.0 metres below ground level (mbgl) or to 0.5m into natural soil (whichever is first) and collection of soil samples at various depths.
- Backfill all soil bores with cuttings and demobilise from the site.
- Dispatch collected samples of soil for chemical analysis.
- Preparing a revised version of the Phase 2 Contamination Assessment report in consideration of the Reporting Guidelines, SEPP55, and the ASC NEPM 2013.

1.3 Regulatory Framework

The Phase 2 was conducted in consideration of the following regulatory framework and guideline documents:

- Contaminated Land Management Act 1997 (NSW) (CLM Act).
- State Environmental Planning Policy No.55 – Remediation of Land 1998 (SEPP55).
- National Environment Protection (Assessment of Site Contamination) Measure 2013 (ASC NEPM 2013).
- Guidelines for Consultants Reporting on Contaminated Sites, 2011 (OEH 2011).
- Sampling Design Guidelines, 1995 (NSW EPA 1995).
- Guidelines for the NSW Site Auditor Scheme (3rd Edition), 2017 (NSW EPA 2017).
- NSW EPA, Waste Classification Guidelines – Part 1: Classifying Waste, 2014 (NSW EPA 2014).

1.4 Certification and Competency of Consultant

All contamination assessment work was conducted by Sullivan-ES. Our Principal Scientist (Mr Adam Sullivan) has achieved tertiary qualifications in Soil Science and Environmental Law. He is a certified Site Contamination Specialist (CEnvP-SC) (Cert. # SC40944) under the Certified Environmental Practitioner Scheme (www.cenvp.org).

Site Information

2.1 Site Identification

The site layout is presented on Figure 2 (**Appendix A**). The following table presents all relevant site identification details.

Table 2-1 Site Identification

Item	Details	
Address	10-16 Loftus Cr 5, 9 & 11 Knight St 88-92a Parramatta Rd 2 Subway Ln. in Homebush NSW 2140	
Local Government	Strathfield Council	
Land zoning	B4 – Mixed Use SP2 – Infrastructure – Local Road (Loftus Lane)	
Property area	Approximately 5,000m ²	
Land Titles (Lot and DP)	<u>10-16 Loftus Cr:</u> Lot 101 DP 846306 Lot 2 DP 314354 Lot 1 DP 201286 Lot 2 DP 201286 Lot A DP 419854 Lot B DP 419854 Lot A DP 335908	<u>88-92a Parramatta Rd:</u> Lot 1 DP 201120 Lot 2 DP 201120 Lot 3 DP 201120 Lot A DP 419617
	<u>5, 9 & 11 Knight St:</u> Lot A DP 335091 Lot 1 DP 336700 SP 1702	<u>2 Subway Ln:</u> Lot 7 DP 18702 Lot B DP 403083

2.2 Site Features

A photographic record of site features in 2016 and 2018 is provided in **Appendix D**.

Loftus Crescent properties:

Previously (2016):

The Loftus Crescent area was relatively flat land sloping gently down to the west and contained single storey brick houses facing Loftus Crescent (**Photo 1** and **Photo 2**). Number 10 was a double storey brick duplex building.

Ground surfaces were mainly unsealed apart from building footprints, driveways and parking areas.

2 Site Information

A fibro cement clad shed was present in the rear yard of No. 15 (**Photo 4**) and broken fibro sheeting was observed nearby on the ground surface of the side access to No. 15 (**Photo 5**).

All buildings on Loftus Crescent and the rear yards to No. 11 and 12, No. 13 and 14, and No. 16 were inaccessible at the time of sampling.

Currently (2018):

All buildings on Loftus Crescent have been demolished (**Photo 10** and **Photo 11**). Some demolition materials and screened soil materials are stockpiled in the central portion of this area. Linx Constructions confirmed (pers. comm. Glenn Francis 17 July 2018) that the materials remaining onsite consist of waste from demolition of site buildings and soil screenings from materials beneath demolished houses/buildings. It was confirmed by Linx that no material had been imported to the site.

Fibre cement sheeting waste was observed in one area of the demolition waste pile (**Photo 12**). Tests results showed the material to be asbestos free. No fibro cement sheets were observed in any other waste materials or any other locations on this area.

Subway Lane property:

Previously (2016):

A motor mechanics/panel beaters workshop building was present facing Subway Lane (**Photo 3**). The ground was relatively flat with a slight fall to the west. The entire area was sealed by concrete.

There were a number of metal lids on the ground surface of the front driveway suggesting evidence of underground tanks (**Photo 3** and **Photo 6**). One of the metal lids was opened and revealed a dip point that was measured and reported a depth to the base of the possible tank of 2.0 metres below ground level (mbgl). There was evidence of an oily liquid at the base of the dip point in the tank. Other metal lids were welded shut and could not be accessed. It was not known if this area was ever used as a service station in the past.

A network of stormwater drainage lines dominated the ground beneath the front of the motor mechanics land.

Currently (2018):

The motor mechanics/panel beaters workshop building has been demolished to slab level (**Photo 13**). Underground tanks are likely to remain under the front driveway of Subway Lane as no ground disturbance has occurred in that area.

A concrete sump pit was observed in the central area of the property (**Photo 14** and **Photo 15**).

No fibro cement sheets were observed anywhere on this area.

Parramatta Road properties:

Previously (2016)

The Parramatta Road area is relatively flat land sloping gently down to the west and contains retail shop buildings that front Parramatta Road. The shops were accessible via a rear lane way that entered from Knight Street (**Photo 7** and **Photo 8**).

Ground surfaces were mainly concrete sealed by building footprints or parking areas apart from the rear access laneway that consists of road base gravel and broken bitumen (**Photo 7** and **Photo 9**).

All buildings were inaccessible.

2 Site Information

Currently (2018)

All buildings within the Parramatta Road area have been demolished (**Photo 16**).

No fibro cement sheets were observed anywhere on this area.

Knight Street properties:

Previously (2016):

This area was not part of the previous work conducted in 2016.

Currently (2018):

Currently the residential flat buildings on #5 and #9 have been demolished to slab level (**Photo 17** and **Photo 18**). A pile of demolition waste was present within #5. The residential flat building on #11 remains present and appears occupied by tenants.

Linx Constructions confirmed (pers. comm. Glenn Francis 17 July 2018) that the materials remaining onsite consist of waste from demolition of site buildings.

No fibro cement sheets were observed in the waste materials or anywhere on this area.

2.3 Site Activities Since 2016

It is understood that since the previous site investigation in 2016, activities onsite have been very limited. All tenants vacated retail and residential dwellings, while the motor mechanics workshop was vacant and unused prior to 2016. Demolition of the majority of site structures occurred in mid-late 2017. Findings of the detailed inspection show negligible surface impacts from demolition activities. No potential asbestos containing materials (ACMs) were observed on the ground surfaces.

In our opinion, it is very unlikely that activities conducted on site since the previous sampling in 2016 would invalidate those test results. Therefore, we have adopted the previous sampling results from 2016 as representative of current site conditions.

2.4 Surrounding Land

The site is bordered by the following land uses:

- North – Parramatta Road then across the road to commercial sites under a B4 land zoning.
- South – Loftus Crescent then the T2 train line (Airport, Inner West and South line).
- East – Retail commercial operations (including a laundromat and possibly combined dry cleaning) then Knight Street.
- West – Retail commercial buildings, then Subway Lane and onto low density residential housing, a car dealership, service and parts facility.

2.5 Environmental Setting

Topography

The site and surrounding lands are generally flat with a slight fall to the west and situated at around 10m above sea level (AHD – Australian Height Datum). Stormwater runoff appears to drain in a westerly direction. There is a large stormwater system running along Subway Lane that connects to an open drainage channel on the north side of Parramatta Road. This channel drains north to Powells Creek.

2 Site Information

Geology and Soils

The site is located on geology described as Triassic period Ashfield Shale comprising black to dark grey shale and laminite (Sydney 1:100,000 Geological Series Sheet 9130, NSW Department of Mineral Resources, 1983). The geological formation correlates well with the soil and rock encountered during this assessment (refer to Borelogs in **Appendix C**).

The soil materials encountered during this assessment were reported to consist of a surface fill material to a depth of approximately 0.5m. Fill material was underlain by natural silty clays to an approximate depth of 2.0-4.0m depth, then shale rock materials.

Groundwater

A review of the NSW DPI Office of Water (DPI-Water) groundwater database (accessed Aug 2018) showed there are four registered groundwater bores within a 500m radius of the site. Details of these registered bore licences are provided below.

Table 2-2 Registered Groundwater Bore Licences

Bore ID	Distance/direction	Date	Depth & SWL ¹	Purpose	Status
GW111479	150m/west	Feb 2011	4.5m/0.9m	Monitoring	Active
GW111480	150m/west	Feb 2011	6.0m/3.07m	Monitoring	Active
GW111481	150m/west	Feb 2011	5.9m/2.7m	Monitoring	Active
GW102670	400m/west	Jul 1993	2.0m/not recorded	Monitoring	Active

(1) Standing Water Level

Acid Sulfate Soils

The site is categorised as Class 5 land in accordance with Strathfield Local Environmental Plan 2012 (<http://maps.strathfield.nsw.gov.au/intramaps80/>). Development consent for acid sulfate soils is required on Class 5 land for works within 500 metres of adjacent Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum and by which the watertable is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2, 3 or 4 land.

The proposed development is unlikely to trigger the need for development consent for acid sulfate soils based on Class 5 works.

2.6 Historical Aerial Photographs

The table below presents details from each aerial photograph reviewed. Historical aerial imagery is presented in **Appendix E**.

In summary, the site has been used for residential purposes on Loftus Crescent since circa 1930, while the Parramatta Road retail buildings have been present since the same time. The motor mechanics workshop was established circa 1960 while large warehouse-style buildings were located on Knight Street prior to 1943 after which residential flat buildings were constructed. Overall there appears to be little historical activity over the site in general that would pose significant contamination issues other than the motor mechanics area and the warehouse buildings on Knight Street prior to 1943.

2 Site Information

Table 2-3 Historical Aerial Imagery Notes

Year	Details
1930 (black & white)	No. 10 Loftus and the residential unit blocks on Knight Street appear to be covered by a warehouse-style building. No. 11 to No. 16 Loftus appear to be residential house buildings with rear yards. The mechanics workshop is not present and this area seems to be vacant or used as an access lane. Subway Lane appears to be a creek/stormwater drainage line. The Parramatta Rd portion is covered by buildings resembling present day structures with the rear access lane also visible.
1943 (black & white)	The buildings on Loftus Cr appear as they do at present. The warehouse-style building on Knight St has been removed and the residential unit blocks have been erected on Knight St appearing as they did recently (prior to some being demolished). The mechanics workshop area is occupied by three small shed structures and appears the ground is unsealed. Subway Lane has been sealed and the drainage line appears covered. The Parramatta Rd buildings appear to be unchanged.
1951 (black & white)	The only change appears to be on the motor mechanics workshop land where the small sheds are gone, and the land appears used as an access lane joining Subway Lane and Knight Street through the rear of the Parramatta Rd buildings. A truck or heavy vehicle appears to be parked on the motor mechanics workshop land.
1961 (black & white)	The only change from the last decade is that a building has been erected to the western side of the motor mechanics workshop land. Vehicles are parked on the street frontage off Subway Lane. It appears that the rear yard of this land is being used as storage or for similar activities.
1972 (black & white)	The site buildings appear similar as they do at present. An extension and new roof to the building on 90-92a Parramatta Rd is visible since the last image.
1982 (colour)	No changes are visible since the last decade. The rear of the motor mechanics is used to park numerous vehicles and possibly a truck.
1994 (colour)	The motor mechanics appears to be using the rear of No. 16 Loftus to park cars, and the rear of the building has been extended with a new shed structure in the eastern corner. No other notable changes have occurred in other areas of the site.
2005 (colour)	No notable changes have occurred.

2 Site Information

Year	Details
Dec 2015 Google Earth imagery (colour)	The site appears unchanged.
2018 Google Earth imagery (colour)	All site buildings have been demolished with the exception of No. 11 Knight Street. No. 7 Knight Street is not within the site boundary and not part of proposed development works.

2.7 Future Land Use

The site is proposed to be developed into three separate high-rise residential apartment buildings on each portion of land with commercial retail on some ground floor areas. The rear access lane will be extended to created Loftus Lane as a dedicated laneway linking Subway Lane and Knight Street. The features of the development include:

- A two-level basement car park to a depth of 6mbgl interlinked underneath the new Loftus Lane link road.
- Retail/commercial outlets occupying the ground floor in particular areas.

The majority of the site area will require bulk earthworks to a depth of at least 6.0mbgl to accommodate the basement car parks, therefore the majority of the existing soils of the site including shallow fill materials, natural soils and shale bedrock will need to be excavated and removed from the site. **Figure 2** identifies areas of the site where deep excavations will occur and where soils will be retained.

Assessment Criteria

The future development of the site will remove the majority of soil materials as a result of bulk earthworks as shown on **Figure 2**. Soils removed as part of basement excavation would not be considered as a contaminated source media. Soils will only be retained along the SP2 zone of Loftus Lane and proposed landscaping and deep soil central areas and fringes along Subway Lane, Loftus Crescent and Knight Street as shown highlighted on **Figure 2**.

The soil criteria adopted for this investigation accounts for soils to be removed from the site as waste materials and therefore waste classification criteria have been used as a substitute for health-based criteria for assessing risks. Health-based land use criteria will only be used to assess residual soils that will remain onsite.

Groundwater and potential vapours may be the only media that presents a potential future risk to residents and receptors.

3.1 Soils

Waste Criteria

The NSW EPA Waste Classification Guidelines 2014 were used in order to provide a waste classification for soils to be removed from basement areas of the site. Classifying wastes into groups that pose similar risks to the environment and human health facilitates their management offsite. These locations included samples collected from BH6, BH9, SB10, SB14, SB15, SB16 and SB19 as shown in Table 3.

ASC NEPM 2013 Criteria

HILs

The ASC NEPM 2013 Health-based Investigation Levels (HILs) for high-density residential land use were used to assess soils to be retained in landscaped areas. These locations included samples collected from BH3, BH5, BH8, SB11, SB17 and SB18 as shown in Table 1.

HILs for commercial/industrial land use were used to assess soils along the dedicated roadway of Loftus Lane. These locations included samples collected from BH1, BH2, BH4, BH7, SB12 and SB13 as shown in Table 2.

Soils within the basement excavation footprint will be removed to a depth of at least 6m and therefore there will be no opportunity for residents to access residual soils in these areas.

HSLs

The ASC NEPM 2013 Health Screening Levels (HSLs) for high-density residential land use and direct contact were used to assess soils to be retained in landscaped areas. These locations included samples collected from BH3, BH5, BH8, SB11, SB17 and SB18 as shown in Table 1.

HSLs for commercial/industrial land use for vapour inhalation and direct contact were used to assess soils along the dedicated roadway of Loftus Lane. These locations included samples collected from BH1, BH2, BH4, BH7, SB12 and SB13 as shown in Table 2.

HSLs for soils were not used in areas within the basement car park given that there will be no vadose zone present as a result of depth of the excavation and likelihood of the basement being submerged in groundwater. The concentration of contaminants in soil samples collected below the water table can be

compromised given the partitioning between phases in saturated conditions. Under this scenario HSLs relevant to groundwater should only be used.

Asbestos HSLs were only used in a qualitative sense given that no asbestos quantification analysis was conducted on samples collected. Analysis was conducted to investigate the presence of asbestos fibres only.

EILs/ESLs

The ASC NEPM 2013 Ecological Investigation Levels and Ecological Screening Levels (EILs and ESLs) for urban residential land use were used to assess soils to be retained in landscaped areas. These locations included samples collected from BH3, BH5, BH8, SB11, SB17 and SB18 as shown in Table 1.

The ASC NEPM 2013 Ecological Investigation Levels and Ecological Screening Levels (EILs and ESLs) were not used in all other areas of the site given that there will be minimal soil environments (i.e. basement areas) or soils will exist under permanently sealed pavements (i.e. roads) that could sustain ecological receptors after development of the site.

Aesthetics

In accordance with the ASC NEPM 2013, the aesthetic state of sites is required to be taken into account and generally relates to the presence of materials with a negligible risk or non-hazardous inert foreign material in soil or fill resulting from anthropogenic sources. Sites that have been assessed as being acceptable from a human health and environmental perspective may still contain such foreign material. An assessment of the site aesthetics requires consideration of the natural state of soil on any given site, and a comparison between it and the soil encountered during investigation works.

In particular, soils on site should not exhibit discolouration (staining), a malodorous nature (odours) or abnormal consistency (rubble and trash).

3.2 Groundwater

The relevant adopted groundwater investigation levels (GILs) were sourced from the ASC NEPM 2013 and supporting documents. The section below provides information on the adopted GILs.

NEPM 2013 HSLs

The ASC NEPM 2013 HSLs have been derived for groundwater in relation to petroleum hydrocarbons; TRH fractions and BTEXN. The approach taken in the development of the HSLs has sought to set a reasonable maximum exposure that corresponds to common scenarios encountered with petroleum based contamination. The HSLs consider the potential risk to human health via the inhalation pathway only. A conservative approach was adopted for groundwater at a shallow depth in a sandy matrix to be representative of site conditions under a high-density land use setting.

ANZECC 2000

The Australian and New Zealand Environment Conservation Council and the Agriculture and Resource Management Council of Australia and New Zealand (ANZECC/ARMCANZ) Water Quality Guidelines (ANZECC 2000 Guidelines) provide trigger values for organic and inorganic chemicals for the protection of freshwater and marine aquatic ecosystems.

For the purposes of this Phase 2, the receiving waters of groundwater discharge would be the marine water ecosystem of Homebush Bay in the Parramatta River, therefore GILs for the protection of marine water environments were adopted.

Australian Drinking Water Guidelines (ADWG) 2011

The National Health and Medical Research Council (NHMRC) and Natural Resource Management Ministerial Council (NRMMC), National Water Quality Management Strategy, ADWG 2011 provides threshold levels for potable water resources. Considering that there are no potable groundwater sources onsite or within surrounding areas, the drinking water criteria were not used for this investigation.

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Methodology

Soil and groundwater sampling locations are presented on Figure 2 (**Appendix A**). The field sampling activities conducted in 2016 were supplemented by additional sampling of soils for this Phase 2 to account for the additional land included within the site along Knight Street. It was considered that sufficient groundwater sampling had been conducted in 2016 to represent groundwater quality and therefore did not require further investigation in 2018.

4.1 Soil Sampling

Details of the soil sampling program are presented below.

Table 4-1 Soil Sampling Works Summary

Activity/Item	Details
Date of Field Activities	22 nd and 29 th March 2016 4 th July 2018
Service Location	Dial Before You Dig plans were reviewed. A certified utility locator surveyed the site before drilling of the soils was conducted.
Concrete Coring	<u>2016</u> : Four bore locations were cored through the concrete to access underlying soils.
Bores Drilled and Sampling	<u>2016</u>: A total of 6 soil bores were completed using a drilling rig to depths of 9.0 mbgl. The bores were drilled as part of a combined geotechnical investigation being undertaken at the site. Four bores were converted into groundwater monitoring wells. A total of 5 soil bores were drilled using a hand auger to depths of approximately 1.0m into natural soils. Sampling locations were labelled BH1 – BH9 and SB10 – SB11. The 11 soil sampling locations meets the minimum recommended number in accordance with NSW EPA Sampling Design Guidelines, 1995 – Table A for an area of approximately 4,000m². <u>2018</u>: A total of 8 soil bores were drilled using a hand auger to depths of approximately 1.0m into natural soils. Sampling locations were labelled SB12 – SB19. The additional 8 soil sampling locations meets the minimum recommended number in accordance with NSW EPA Sampling Design Guidelines, 1995 – Table A for an area of approximately 2,000m² that covers the additional site area of properties along Knight Street.

Activity/Item	Details
Soil Logging	Soil and rock type classifications and descriptions are based on Unified Soil Classification System (USCS) and on Australian Standard AS4482.1-1997 <i>"Guide to sampling and investigation of potentially contaminated soil"</i>. Soil descriptions for the lithology encountered onsite are presented in the borelogs in Appendix C. Borelogs from a geotechnical investigation (D. Katauskas 2016) are also included.
Soil Sampling	Soil samples were taken directly from the soil cuttings using nitrile gloves that were changed between samples. All soil samples were placed in clean, laboratory-supplied acid washed solvent rinsed glass jars. Asbestos samples were placed in laboratory supplied zip-lock bags.
Soil Screening	<u>2016</u>: Soil samples were field screened for the potential presence of hydrocarbons/volatile organic carbons (VOCs) using a photo-ionisation detector (PID) that was calibrated to a known concentration (100 parts per million (ppm)) of iso-butylene calibration gas. Calibration records are presented in Appendix F. <u>2018</u>: No PID field screening was conducted.
Decontamination Procedures	Reusable sampling equipment was decontaminated between sampling locations with potable water and a solution of Decon 90.
Sample Preservation	Samples were stored on ice in an insulated cool box whilst onsite and during transit to the laboratory. All samples analysed for the contaminants of concern were submitted and analysed within the required holding period.
Disposal of Soil Cuttings	Soil cuttings were used to backfill boreholes once samples had been collected. Surplus soils were left at the site.
Disposal of consumable materials	Single use materials used during sampling were placed into garbage bags and disposed offsite.

4.1.1 Soil Sample Analysis

A total of 30 soil samples were collected and analysed by ALS Environmental under NATA accreditation. The soil analysis included:

2016:

- 18 primary soil samples were analysed for TPH/TRH, BTEXN, PAH, and 8 heavy metals.
- 11 soil samples were analysed for the presence of asbestos.
- 3 soil samples were analysed for VOCs.
- 2 soil samples were analysed for heavy metal leaching capacity (TCLP).
- 2 soil samples were analysed for BaP leaching capacity (TCLP).
- 2 field quality control (Q01 and Q02) duplicate sample was analysed for TPH/TRH, BTEXN, PAH, and 8 heavy metals.
- 1 trip blank was analysed for BTEXN.

2018:

- 12 primary soil samples were analysed for TPH/TRH, BTEXN, PAH, and 8 heavy metals.
- 7 soil samples and 1 fragment material were analysed for the presence of asbestos.

- 2 soil samples were analysed for heavy metal leaching capacity (TCLP).
- 2 soil samples were analysed for BaP leaching capacity (TCLP).
- 2 field quality control (QC04 and QC05) duplicate sample was analysed for TPH/TRH, BTEXN, PAH, and 8 heavy metals.
- 1 trip blank was analysed for BTEXN.

4.2 Groundwater Sampling

Details of the groundwater sampling program conducted in 2016 are presented below.

Table 4-2 Groundwater Sampling Works Summary

Activity / Item	Details
Date of Field Activities	Groundwater well construction and development: 22 nd and 28 th March 2016. Groundwater sampling: 5 th April 2016.
Well Construction	Four temporary groundwater wells were constructed at each of the following locations: BH1, BH4, BH5 and BH6. Each was secured at the ground surface with a metal gatic cover. Construction materials consisted of 50mm uPVC casing/screen, 0.4mm aperture screen, 2mm washed sand, and bentonite pellet seal. Each new groundwater well was developed using a disposable bailer to remove silt and sediment.
Well Gauging	The groundwater wells were gauged using an oil/water interface probe for: • depth to groundwater (SWL – Standing Water Level) • total depth • presence of phase separated hydrocarbons (PSH).
Well Purging	Monitoring wells were purged using a disposable bailer. Field parameter measurements were taken using a water quality meter for pH, dissolved oxygen (DO), reduction/oxidation potential (redox), temperature and electrical conductivity (EC). Field data sheets showing purging details are presented in Appendix F .
Sampling Method	Four groundwater samples were collected using a disposable bailer. Groundwater samples were labelled BH1, BH4, BH5 and BH6.
Sample Preservation	Samples were placed in laboratory-supplied bottles containing appropriate preservatives. Samples were stored on ice in a cooler while on-site and in transit to the laboratory. Samples collected for metals analysis were filtered onsite through a 0.45 µm filter cartridge and put in to preserved laboratory supplied bottles.
Decontamination Procedure	The oil / water interface probe was washed in Decon 90 solution and rinsed with potable water between measurements. The water quality meter was rinsed in potable water between sampling.
Disposal of consumable materials	Single use materials were placed in garbage bags and disposed off-site.

4.2.1 Groundwater Sample Analysis

A total of 4 primary groundwater samples and 1 field duplicate sample (QA) were collected in 2016. Samples were submitted to ALS Environmental for analysis for TPH/TRH, BTEXN, PAH, 8 heavy metals and VOCs. One trip blank sample was analysed for BTEXN.

Two groundwater samples were reanalysed for TPH/TRH with silica gel clean-up.

4.3 Quality Assurance and Quality Control

The Phase 2 works were completed following standard operating procedures for conducting site contamination investigations. Standards followed included:

- General field documentation
- Health and safety
- Use of Personal Protective Equipment (PPE)
- Representative sample collection and labelling
- Equipment calibration
- Chain of Custody documentation for analytical samples
- Decontamination
- Collection of quality control samples (may include: intra laboratory, inter laboratory, rinsates, blanks, spikes).

The data validation guidelines adopted are based upon the following data validation guidance documents published by the United States Environmental Protection Agency (USEPA):

- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (EPA 540-R-10-011, dated January 2010)
- USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA 540/R-99/008, dated June 2008)
- National Environment Protection (Assessment of Site Contamination) Measure (ASC NEPM 2013).

The process involves the checking of analytical procedure compliance and the assessment of the accuracy and precision of analytical data from a range of quality control measurements generated from both field sampling and analytical programs. Specific elements that have been checked and assessed for this project include:

- preservation and storage of samples upon collection and during transport to the laboratory
- holding times
- use of appropriate analytical procedures
- required LOR
- frequency of conducting quality control measurements
- laboratory blanks
- field duplicates
- laboratory duplicates
- matrix spike/matrix spike duplicates (MS/MSDs)
- surrogates (or System Monitoring Compounds)
- the occurrence of apparently unusual or anomalous results, e.g. laboratory results that appear to be inconsistent with field observations or measurements.

Results and Discussion

5.1 Site Geology

The general geology at the site is presented in the table below, giving a general description of materials across the site based on the findings of this Phase 2. Borelogs are presented in **Appendix C**.

Table 5-1 General Site Geology

Approximate Depths	General Description
Pavement	Concrete or hardstand covering large areas of the site including former/current building footprints.
0.0 to approx. 0.5 mbgl	Fill: Shaley/gravelly clay mixtures, clayey gravels, black charcoal gravels and black ash gravels in some areas, silty sands, crushed sandstone.
0.5 to approx. 2.0 - 5.0 mbgl	Natural: Silty Clay, variable plasticity, moist, brown/grey, red mottling.
Starting at approx. 2.0 to 5.0 mbgl	Bedrock: Weathered shale and shale.

5.2 Field Observations

Field observations indicated the following:

- The site was characterised by a number of buildings in 2016. No sampling of soils could be conducted within the footprint of any of the buildings or inaccessible areas at that time.
- Metal lid covers (**Photo 3** and **Photo 6**) located in the forecourt parking area of the motor mechanics workshop is evidence of underground tanks being present beneath this area. The tanks will need to be removed and surrounding soils validated.
- A small concrete pit is located within the former mechanics/panel beater workshop (**Photo 14**). Once the slab has been demolished the localised soils should be inspected for signs of contamination, and if so, additional sampling would be warranted to quantify contamination risk.
- No odours were observed at any sampling locations and PID readings were not elevated.
- No potential ACM sheeting or fragments were observed on the ground surface anywhere onsite. One sample of fibre cement was collected from a small pile of demolition rubble but was shown to be asbestos free.
- Fill material was generally a thin surface layer of varying quality, showing no significant gross impacts.
- Black granular materials in the surface fill was observed at some locations suggesting charcoal or ashy gravel material. These materials were observed at BH7, BH8, SB10, SB11, SB12, SB13, SB14, SB15, SB16, SB18(likely) and SB19.
- Natural soils were typically clays above natural shale rock, showing no indication of contamination.
- Groundwater was encountered at the base of the clay formation or within the weathered shale rock material and recharge was very slow.

5.3 Soil Results and Discussion

Soil analytical data are presented in Table 1, Table 2, Table 3 and Table 4 of **Appendix B** and in the laboratory reports contained in **Appendix H**.

5.3.1 Retained Soils in Landscaped Areas

The results presented in Table 1 show that some contaminants reported results in excess of the adopted assessment criteria for soils to be retained at the site in landscaped areas. The following detections exceeded criteria:

HILs

- BH5_0.5-0.6m in fill material that reported BaP TEQ (4.9mg/kg) exceeding the HIL B criterion (4mg/kg).
- SB11_0.3-0.5 in fill material that reported BaP TEQ (5.2mg/kg) exceeding the HIL B criterion (4mg/kg).
- SB18_0.2-0.3 in fill material that reported BaP TEQ (7.0mg/kg) exceeding the HIL B criterion (4mg/kg).

ESLs

- BH5_0.5-0.6 in fill material that reported BaP (3.2mg/kg) and TRH (>C10-C16) (300mg/kg) exceeding the ESL urban criteria (0.7mg/kg and 300mg/kg, respectively).
- BH8_0.1 in fill material that reported BaP (0.9mg/kg) and TRH (>C10-C16) (540mg/kg) exceeding the ESL urban criteria (0.7mg/kg and 300mg/kg, respectively).
- SB11_0.3-0.5 in fill material that reported BaP (3.6mg/kg) exceeding the ESL urban criterion (0.7mg/kg).
- SB18_0.2-0.3 in fill material that reported BaP (4.9mg/kg) and TRH (>C10-C16) (370mg/kg) exceeding the ESL urban criteria (0.7mg/kg and 300mg/kg, respectively).

Aesthetics

The identification of charcoal and ashy gravels at numerous locations including BH8, SB11 and SB18 causes an unacceptable aesthetic issue for retained soils in landscaped areas.

Human Health and Ecological Risks

The detectable concentration of carcinogenic BaP TEQ at BH5, SB11 and SB18 in surface fill layers warrant remediation to remove human health contamination risks and unacceptable aesthetic issues within landscaped areas of the future development.

The likely cause of soil contamination is the charcoal/ashy gravels spread throughout the surface/near surface fill materials. There are no discernible contamination hotspots.

The calculated 95% Upper Confidence Limit (UCL) of the arithmetic mean concentration for BaP TEQ was 4.59mg/kg which exceeds the adopted HIL of 4mg/kg; as such all surface/near surface fill material within proposed landscaped areas impacted with charcoal/ash gravels poses an unacceptable risk to human health warranting remediation. The 95% UCL calculation was conducted using ProUCL software and is presented in **Appendix G**.

Detections of BaP and TRH at the same locations above pose potential ecological risks to terrestrial receptors; however, rectification of risks to human health will also remedy ecological risks.

5.3.2 Retained Soils under Loftus Lane

The results presented in Table 2 show that no contaminants reported results in excess of the adopted health investigation levels in soils to be retained at the site under Loftus Lane, the exception being:

- BH7_0.2m in the surface fill material that reported BaP TEQ (50.4mg/kg) exceeding the HIL D criterion (40mg/kg).

The BaP impacts are attributed to charcoal/ash gravels as the contamination source in poor quality fill material from historical activities. The fill materials at and around BH7 are unsuitable and require management or removal, however the impacts are expected to be localised and limited in extent to the thin fill layer under the road base gravels and above the natural clays. It is expected that the soils within the new roadway of Loftus Lane that will be constructed over the area of BH7 will require relaying to meet engineering design specifications, as such the impacted fill at BH7 will be removed to meet the specifications regardless.

The indicative waste classification for impacted fill at BH7 is governed by the elevated concentrations of Lead (Pb) (428mg/kg) and BaP (35.1mg/kg) and would be classified as Hazardous Waste if soils are to be removed offsite and disposed at a landfill. This waste classification is preliminary and based on total concentrations only. The classification should be verified with leachable concentration (TCLP) results at the time of bulk earthworks prior to removal from the site in accordance with the NSW EPA Waste Classification Guidelines, 2014.

Sampling locations BH1 and BH2 are proximal to possible underground tanks. The soil results for these locations show no impacts from the tanks.

5.3.3 Excavated Soils for New Basement Areas

Table 3 shows that surface fill materials within basement footprints to be excavated and removed from the site would generally indicate a waste classification of General Solid Waste; the exception to this would be:

- BH9_0.2: Hazardous Waste based on the concentration of Pb (667mg/kg) in the surface fill.

These waste classifications are preliminary in nature and based on total concentrations only. Waste classifications should be verified with leachable concentration (TCLP) results at the time of earthworks prior to removal from the site in accordance with the NSW EPA Waste Classification Guidelines, 2014.

Table 4 presents leaching results of fill materials at BH6 and SB16. The results show a negligible leaching capacity and are indicative of the leaching potential of general fill materials that will be excavated to make way for the basement car parks. The fill materials at BH6 and SB16 would be classified as General Solid Waste (GSW) in accordance with the NSW EPA Waste Classification Guidelines, 2014; however, verification sampling is needed at the time of bulk earthworks.

Table 3 shows that natural soil/rock materials within the new basement footprints to be excavated are not impacted and show natural concentrations of analytes. As such the natural soils/rock can be indicatively classified as Virgin Excavated Natural Material (VENM) within the meaning provided in Schedule 1 of the Protection of the Environment Operations Act 1997.

Table 4 presents soil leaching results for BH2 in natural soils, showing that the natural soils beneath the proposed roadway of Loftus Lane do not leach. These results are also a reflection of the potential leaching capacity of natural soils that are to be excavated and disposed offsite (i.e. for car park basement areas).

Residual natural soils/rock will exist below the basement car park floor (i.e. greater than 6m depth) and will not be accessible to any residents of the site. Regardless, the analytical results show the natural

soils/rock contain no elevated concentrations of contaminants, and pose no risk to human health and are suitable to remain on the site.

5.4 Site Hydrogeology

The following table presents details of site hydrogeology.

The Standing Water Level (SWL) is a reflection of the potentiometric head level of the watertable. As a result, the groundwater level may be much deeper and reside in the shale rock material rather than at the depth of the measured SWL. No shallow groundwater was observed during drilling of the boreholes which supports this assertion. The elevated electrical conductivity readings are a reflection of the saline environment governed by the natural shale bedrock indicating that groundwater is likely to be present in the shale bedrock rather than perched in the shallower soils.

Table 5-2 Site Hydrogeology

Activity / Item	Description
Groundwater Occurrence	<u>Well ID</u> <u>SWL (mbtoc)</u> <u>Bore Depth (mbtoc)</u>
	BH1 4.14 5.81
	BH4 2.69 6.86
	BH5 2.11 8.72
	BH6 1.74 5.0
Occurrence of PSH	No PSH was measured in the groundwater wells and no hydrocarbon sheens or odours were observed.
Field Parameter Measurement	At the time of sampling the following measurements were taken: <u>BH1</u> : EC (16.4mS/cm), pH (5.1), Temp (23.9 °C), Redox (137mV), DO (4.3mg/L). The water was clear with slight cloudiness, no odours. <u>BH4</u> : EC (8.21mS/cm), pH (6.3), Temp (21.4 °C), Redox (115mV), DO (5.1mg/L). The water was very dark grey and turbid, no odours. <u>BH5</u> : EC (15.3S/cm), pH (5.6), Temp (23.7 °C), Redox (99mV), DO (2.4mg/L). The water was very turbid grey/black with an anoxic/salty odour. <u>BH6</u> : No readings taken – too silty.

5.5 Groundwater Results and Discussion

Groundwater analytical results for this Phase 2 are presented in Table 5 (**Appendix B**) and in the laboratory reports contained in **Appendix H**.

The results show that no contaminants reported results in excess of the adopted GILs, the exception being the following:

- Cadmium at BH1 (0.0576mg/L) and BH5 (0.001mg/L).
- Copper at BH1 (0.026mg/L) and BH4 (0.002mg/L).
- Nickel at BH1 (0.182mg/L), BH4 (0.057mg/L), BH5 (0.316mg/L) and BH6 (0.01mg/L).
- Zinc at BH1 (0.397mg/L), BH4 (0.114mg/L) and BH5 (0.872mg/L).
- Phenanthrene at BH6 (1.8ug/L).

It is noted that onsite fill/soil materials show no excessively elevated levels of the metals as was detected in groundwater, and as such there appears to be limited contamination source of these analytes originating from the site. Elevated levels of metals, especially copper, nickel and zinc, are common in galvanised and metallic structures in urbanised areas and are a potential source.

The collected groundwater samples were generally sediment laden and potentially attributed to anomalous results. Although phenanthrene (a constituent of PAH) was detected at elevated concentrations in the surface fill proximal to BH6 (at BH7 – 60.6mg/kg), these compounds are relatively insoluble and non-leaching, as represented by ashy samples from SB18 that showed non-leaching capacity for BaP (refer to Table 4). It is unlikely that the detection of phenanthrene in the groundwater at BH6 would be caused by leaching ash fill materials. Regardless, the detections are considered marginal and no cause for concern. The elevated levels may also be attributed to ambient sources within the highly urbanised area of Homebush and as such are not considered to be of significance that warrants further assessment or precludes use of the site for its intended use.

Other organic contaminants that were detected in groundwater, albeit below the adopted GILs, included:

- TRH F2 (>C10-C16) at BH5 (210ug/L) and BH6 (220ug/L).
- TRH (>C16-C34) at BH5 (1,540ug/L) and BH6 (1,190ug/L).
- TRH (>C34-C40) at BH5 (420ug/L) and BH6 (310ug/L).
- Chloroform at BH6 (9ug/L).
- Toluene at BH5 (4ug/L) and BH6 (4ug/L).

Shale bedrock is a known source of shale oil and commonly attributes to detections of longer chain hydrocarbons (i.e. >C16) in samples of natural soil and groundwater. Hydrocarbon impacts listed above are not related to the underground tanks in the forecourt of the motor mechanics because groundwater proximal to the underground tanks at BH1 shows no impacts.

Groundwater samples reporting detections of hydrocarbons were reanalysed with silica gel clean-up (TRH-silica), after which the results for TRH F2 (>C10-C16) were reported below the LOR while other TRH longer chain fractions (i.e. >C16) remained relatively similar in concentration. The longer chain hydrocarbons (>C16) are therefore of a petrogenic source, such as shale oils. The detectable hydrocarbons in the groundwater are well below the GILs and pose negligible risk to human health, and are attributed to the natural oils from the shale bedrock. Given the natural origins of the hydrocarbon, ecological receptors would not be placed at risk.

Detections of chloroform and toluene are considered anomalies as they are marginally above the LOR and significantly below the GIL and pose no risk to receptors.

Groundwater well BH6 was positioned proximal to the offsite laundromat (potential dry-cleaning operation) on the adjoining eastern boundary (**Figure 2**). Results from BH6 show no impacts from dry cleaning chemicals in the groundwater. However, the detection of chloroform could be residual impacts from the use of bleaches by the laundromat offsite, although this assumption has not been verified.

5.6 Conceptual Site Model

A conceptual site model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between them.

A CSM was developed in consideration of the existing results and site information. The CSM takes into account the future use of the site under the proposed development.

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Table 5-3 Conceptual Site Model

Source of Contamination	Contaminants of Concern	Impacted Media	Exposure Route or Pathway	Receptor	Linkage
Primary Source: Existing fill material within proposed landscaped areas	Benzo(a)Pyrene (BaP) TRHs	Soils	Ingestion (soil) Inhalation (dust) Dermal contact (soil)	Future residents Construction/maintenance workers Terrestrial biota	<u>Likely:</u> Contaminated surface fill materials across soils to be retained onsite in landscaped areas are impacted by charcoal and ashy gravels. The contaminated fill would be readily accessible if left in place. Health risks to human and terrestrial receptors is unacceptable and warrants remediation.

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Quality of Analytical Data

Analytical data validation is the process of assessing whether the data is in compliance with method requirements and project specifications. The primary objective of this process is to ensure that data of known quality are reported, and to identify if data can be used to fulfil the overall project objectives.

On the basis of the analytical data validation procedure employed, the overall quality of the soil and groundwater analytical data produced is considered to be of an acceptable standard for interpretive use. The table below provides a summary of the data validation.

Table 6-1 Data Quality

Requirement	Compliance	Comments
Field Duplicates	Yes	Intra-laboratory duplicate samples were collected by splitting a sample into the primary and duplicate sample containers. At least 1 duplicate per 10 primary samples was analysed for both soil and water samples.
Blanks	Yes	Trip blank samples were analysed for soil and water. Results reported non-detectable concentrations.
RPDs	Yes	All calculated RPDs fall within the acceptable range of <50%. Acceptable exception is when concentrations are relatively low (i.e. within 10-20 times LOR) which can show higher RPDs. Where concentrations of either sample is <LOR or <10 times the LOR, then no RPD was calculated.
Sampling equipment properly decontaminated	Yes	Disposable equipment used. Probe, pump, water quality meter and hand auger decontaminated between sampling locations.
Rinsate sample	N/A	Disposable sampling equipment was generally used. No rinsate was collected from the hand auger.
Sample Preservation	Yes	Samples were properly preserved. Samples were compliant with required storage temperature.
Samples delivered to laboratory within sample holding times.	Yes	Confirmed from COCs and laboratory reports. There were two minor non-compliances with holding times for MAHs, however these were marginal and would not impact on the representativeness of the samples.
Equipment Calibration	Yes	Refer to Appendix F .
Analytical procedures	Yes	All procedure are NATA accredited. There were a few non-compliant outliers for laboratory duplicate frequency analysis; however, this was considered acceptable under their internal QC.

Requirement	Compliance	Comments
SOP and competent field personnel	Yes	Sampling procedures follow industry standards, and field staff (Adam Sullivan – 20 years' experience) were competent in sampling methods and QA/QC protocols.

Conclusion and Recommendations

Sullivan-ES make the following conclusions based on the findings of this revised Phase 2, subject to the report limitations presented in Section 9:

Site History and Conditions

- Historical aerial photos show that the site has been used for residential purposes on Loftus Crescent since circa 1930, while the Parramatta Road retail buildings have been present since the same time. The motor mechanics workshop was established at 2 Subway Lane circa 1960 while large warehouse-style buildings were located on Knight Street prior to 1943 after which residential flat buildings were constructed.
- Overall there appears to be little historical activity over the site in general that would pose significant contamination issues other than the motor mechanics/panel beaters workshop and the warehouse buildings on Knight Street prior to 1943. It is not known if the motor mechanics/panel beaters workshop was ever used as a service station in the past.
- Based on the findings of a detailed site inspection and review of site activities since 2016, it was found to be very unlikely that activities conducted on site since the previous sampling in 2016 would invalidate those test results. As such, test results from 2016 were adopted for reporting in this Phase 2.

Soils and Contamination Sources

- The site soils generally comprise shallow layers of fill material underlain by natural clays, followed by competent shale bedrock at approximately 2.0-5.0 mbgl. No perched groundwater was encountered as groundwater resides in the natural deeper clay/shale strata.
- Black granular materials in the surface fill layers was observed at a number of sampling locations indicating charcoal or ashy gravel material.
- Metal lid covers located in the forecourt parking area of the motor mechanics workshop is evidence of underground tanks being present beneath this area. The tanks will need to be removed and surrounding soils validated. Soil and groundwater sampling results show no detection of contaminants proximal to the tanks.
- A small concrete pit is located within the former mechanics/panel beater workshop. Once the slab has been demolished the localised soils should be inspected for signs of contamination, and if so, additional sampling would be warranted to quantify contamination risk.
- Detectable concentrations of the contaminant BaP TEQ over the human health land use criteria at sampling location BH5, SB11 and SB18 is caused by charcoal/ash gravels warranting remediation to remove human health contamination risks and unacceptable aesthetic issues within landscaped areas of the future development.
- The calculated 95% Upper Confidence Limit (UCL) of the arithmetic mean concentration for BaP TEQ was 4.59mg/kg which exceeds the adopted human health criteria of 4mg/kg, as such all surface/near surface fill material impacted with charcoal/ash gravels within proposed landscaped areas of the development poses an unacceptable risk to human and ecological health warranting remediation.
- All soils to be retained onsite under the new roadway of Loftus Lane meet the adopted human health investigation criteria for such land use under a commercial/industrial setting.
- The exception to this is the fill material at sampling location BH7 which is impacted by PAHs and attributed to the charcoal/ash gravels. The impacts are expected to be localised in the immediate

area around BH7. The impacted fill material in this area will be removed regardless to construct the new Loftus Lane roadway over BH7.

- The indicative waste classification for impacted fill at BH7 is Hazardous Waste, however this is a preliminary classification based on total concentrations only. At the time of bulk earthworks and prior to removal from the site, waste classifications should be verified with leachable concentration (TCLP) results in accordance with the NSW EPA Waste Classification Guidelines, 2014.
- Fill materials to be excavated for the new car park basements can be removed offsite under an indicative waste classification as either General Solid Waste or Hazardous Waste. However, as before, these waste classifications are preliminary and based on total concentrations only. At the time of bulk earthworks and prior to removal from the site, any waste classifications must be verified with leachable concentration (TCLP) results in accordance with the NSW EPA Waste Classification Guidelines, 2014.
- Natural soils and bedrock to be excavated for the new car park basements can be removed offsite as Virgin Excavated Natural Material (VENM) as defined in Schedule 1 of the Protection of the Environment Operations Act 1997.
- Residual natural soils and rock remaining after bulk earthworks contains no elevated concentrations of contaminants and poses no risk to human health and are therefore suitable to remain on the site.

Groundwater

- Detections of contaminants (predominately metals) in groundwater is attributed to endemic urban sources given that there are unlikely to be any related contamination sources of this nature on the site.
- Detections of hydrocarbons in the groundwater is attributed to the naturally occurring longer chain petrogenic sources in the shale bedrock. The concentrations are reported below the health screening levels.
- Low level detection of contaminants in groundwater are not considered a cause for concern that would warrant further assessment or precludes use of the site for its intended use.
- Groundwater well BH6 was positioned proximal to the laundromat (potential dry cleaning operation) on the adjoining eastern boundary. Results from BH6 show no impacts from dry cleaning chemicals in the groundwater. However, the low-level detection of chloroform could be residual impacts from the use of bleaches by the laundromat offsite, although this assumption has not been verified.

Recommendations

- Prepare a Remedial Action Plan (RAP) to address the identified soil contamination within proposed landscaped areas and document protocols for waste classification of soil/fill to be removed offsite. The RAP should be prepared by a suitably competent consultant specialising in contaminated land management.
- Underground tanks located in the forecourt parking area of the motor mechanics workshop are to be removed in accordance with Australian Standard methods and the soils validated in accordance with the Protection of the Environment (Underground Petroleum Storage System) Regulations 2014. The tank decommissioning works should be included with the RAP.
- Once the slab of the motor mechanics workshop has been demolished, the localised soils around the concrete sump pit should be inspected for signs of contamination, and if so, additional sampling would be warranted to quantify contamination risks particular to this area. These details should be documented in the RAP.

References

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Friebel, E & Nadebaum, P 2011, Health screening levels for petroleum hydrocarbons in soil and groundwater. Summary, CRC CARE Technical Report no. 10, CRC for Contamination Assessment and Remediation of the Environment, Adelaide, Australia.

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US EPA, 2000, Guidance for the Data Quality Objective Process, EPAC QA/G-4 DEC/600R-96/055, United States Environmental Protection Agency Office of Environmental Information, Washington DC.

USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (EPA 540-R-10-011, dated January 2010)

USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA 540/R-99/008, dated June 2008)

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Limitations

Sullivan Environmental Sciences Pty Ltd (Sullivan-ES) has prepared this report in accordance with the usual care and thoroughness of the consulting profession for the use of Statewide Planning and only those third parties who have been authorised in writing by Sullivan-ES to rely on this Report.

It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this Report.

Where this Report indicates that information has been provided to Sullivan-ES by third parties, Sullivan-ES has made no independent verification of this information except as expressly stated in the Report. Sullivan-ES assumes no liability for any inaccuracies in or omissions to that information.

This Report was prepared between 22 March 2016 - 9 June 2016 (initial Phase 2 sampling) and the 4 July 2018 – 13 September 2018 (recent Phase 2 sampling) and is based on the conditions encountered and information reviewed at the time of preparation. Sullivan-ES disclaims responsibility for any changes that may have occurred after this time.

Investigations undertaken in respect of this Report are constrained by the particular site conditions, such as the location of buildings, services and vegetation. As a result, not all relevant site features and contamination may have been identified in this Report, in particular under site buildings and other inaccessible areas as noted in this Report.

Subsurface conditions can vary across a particular site and cannot be exhaustively defined by the investigations described in this Report.

This Report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This Report does not purport to give legal advice.

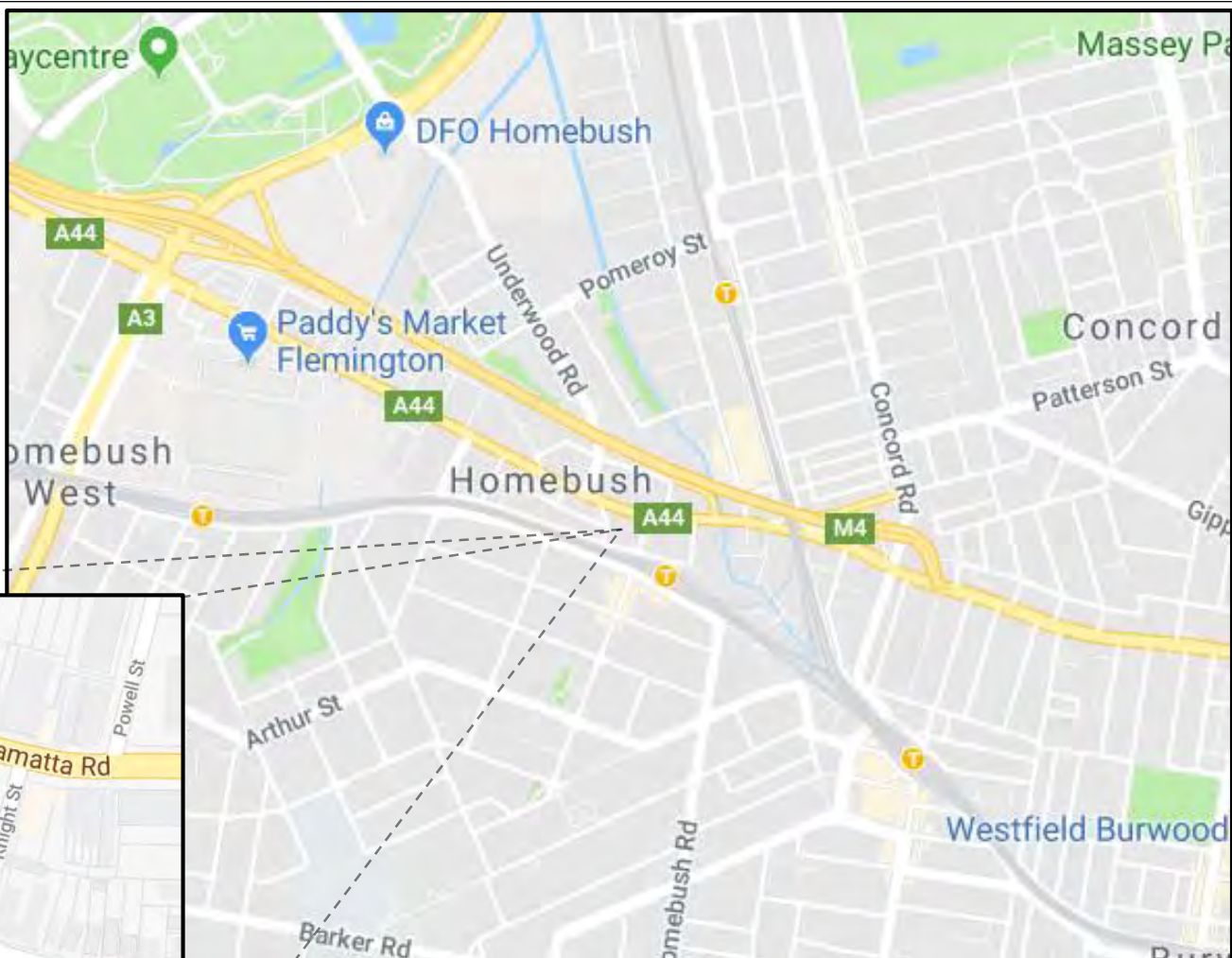
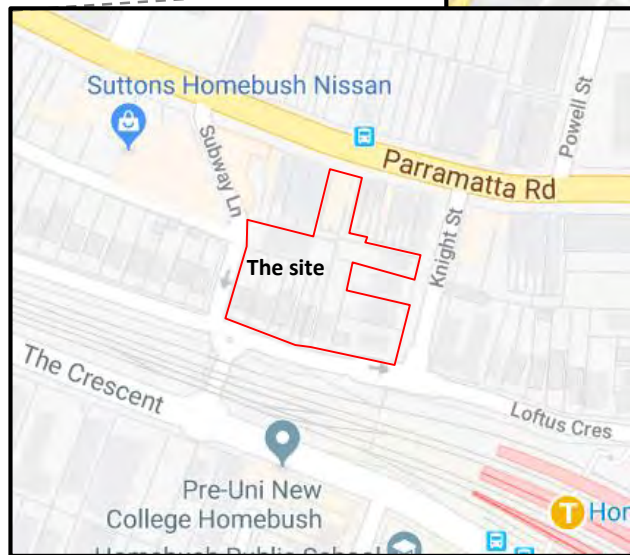
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It is the responsibility of third parties to independently make inquiries or seek advice in relation to their particular requirements and proposed use of the site.

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Appendix A Figures



Not to scale Date: 24/08/18

Source: Google Maps 2018



Project #: **SES_442**

Title: **Phase 2 Contamination Assessment**

Figure 1: **Site Location**

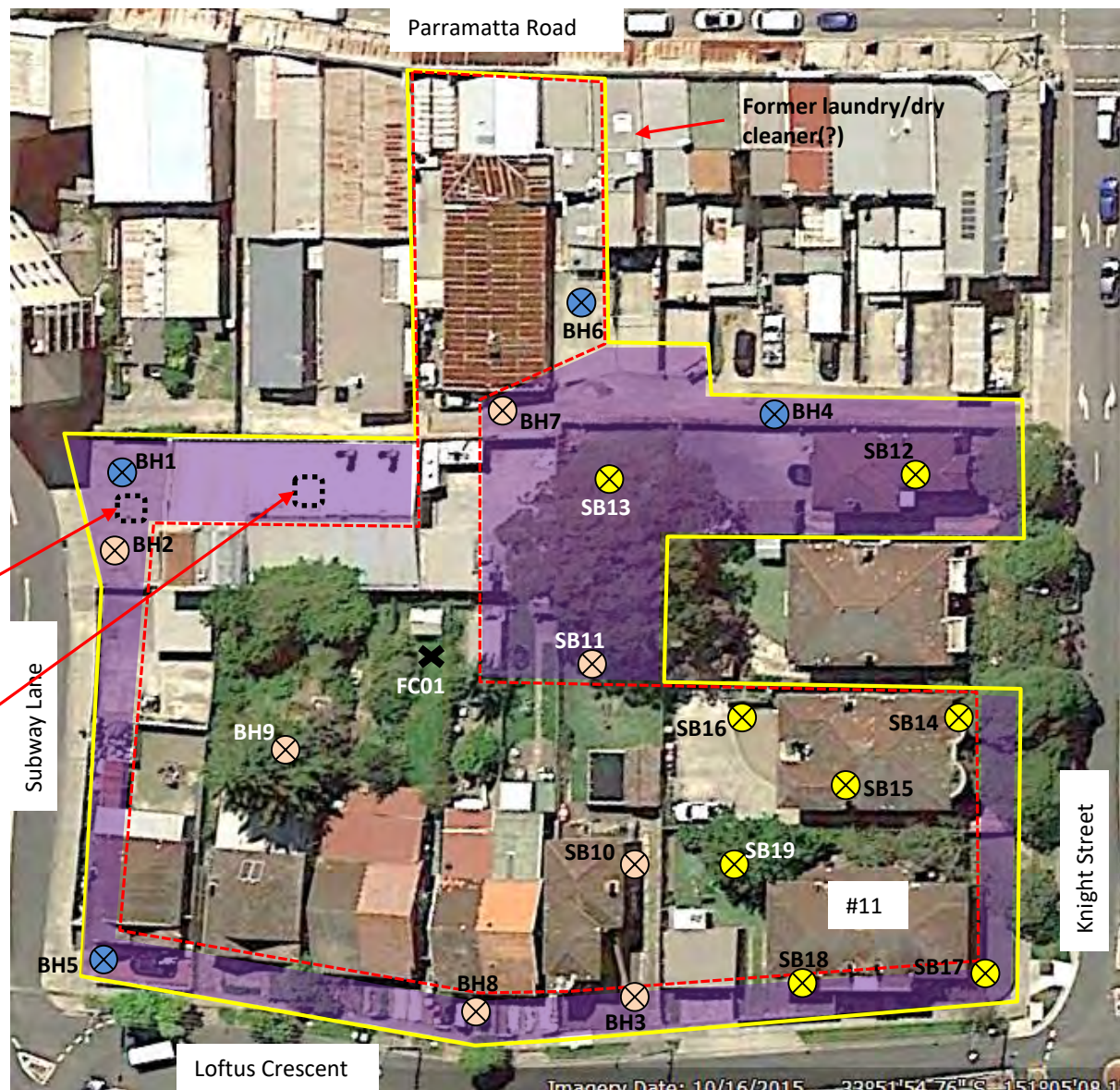
Address: **Properties on Loftus Cr, Knight St, Parramatta Rd and Subway Ln, Homebush NSW**

-  Groundwater well (2016)
-  Soil bore (2016)
-  Additional soil bore (2018)
-  Fibre cement waste sample (2018)
-  Area outside basement excavation (Loftus Lane & Landscaped Areas)
-  Basement excavation

Note: All structures demolished to ground level except 11 Knight St (as shown).

Underground tank/s

Concrete pit



Date: 24/08/18 All added labels are approximate

Source: Google Earth 2018



Project #: **SES_442**

Title: **Phase 2 Contamination Assessment**

Figure 2: **Site Layout & Sampling Locations**

Address: **Properties on Loftus Cr, Knight St, Parramatta Rd and Subway Ln, Homebush NSW**

Appendix B Results Tables

Table 1
Soil Analytical Results and QA/QC
Landscaped Areas - Homebush
Statewide Planning Pty Ltd
Proj # SES_442

Analyte	Moisture Content (dried @ 103°C)	Identification of Asbestos						Total Metals by ICP-AES								Polynuclear Aromatic Hydrocarbons															
		Asbestos Detected	Asbestos (trace)	Asbestos Type	Sample weight (dry)	Description	APPROVED IDENTIFIER:	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Mercury	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	
Units	%	g/kg	fibres	-	g	-	-	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
LOR	1	0.1	5	-	0.01	-	-	5	1	2	5	5	2	5	0.1	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	
HIL B	-	Presence	Presence	-	-	-	-	500	150	500	30,000	1,200	1,200	60,000	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
HSL A/B Inhalation 0-1m - sand (NEPM 2013)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
HSL B Contact (CRC 2011)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
EIL Urban (NEPM 2013)	-	-	-	-	-	-	-	100	-	400	190	1,100	170	400	-	170	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
ESL Urban (NEPM 2013)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7	-	-	

Sample ID	Depth	Date																														
Retained Soils in Landscaping Areas																																
BH3_0.2-0.4	0.2-0.4	22/03/2016	26.0	No	No	----	42.7	Mid brown clay soil	C.OWLER	<5	<1	18	21	24	4	7	<0.1	<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		
BH3_1.8-2.0	1.8-2	22/03/2016	16.1	----	----	----	----	----	----	<5	<1	5	14	20	<2	<5	<0.1	<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		
BH5_0.5-0.6	0.5-0.6	28/03/2016	19.4	No	No	----	55.5	Mid brown clay soil	G.MORGAN	5	<1	12	42	68	11	67	<0.1	<0.5	<0.5	<0.5	<0.5	3.7	0.8	6.1	6.6	3.1	3.2	3.4	1.4	3.2	2.3	0.6
BH5_2.5-2.8	2.8-2.8	28/03/2016	15.5	----	----	----	----	----	----	<5	<1	7	9	8	<2	<5	<0.1	<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	
QC02	--	28/03/2016	16.4	----	----	----	----	----	----	5	<1	10	15	13	<2	6	<0.1	<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	
RPD%			5.6	----	----	----	----	----	----	----	----	35.3	50.0	47.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	
BH8_0.1	0.1	28/03/2016	13.1	No	No	----	35.0	Mid brown clay soil	G.MORGAN	8	<1	15	68	299	7	277	0.2	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	1.3	1.5	0.8	0.8	1.0	<0.5	0.9	0.6	<0.5
BH8_1.1	1.1	28/03/2016	24.7	----	----	----	----	----	----	5	<1	25	12	20	5	26	<0.1	<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	
SB11_0.3-0.5	0.3-0.5	22/03/2016	20.8	No	No	----	44.5	Mid brown clay soil with red rocks	C.OWLER	5	<1	24	26	58	4	29	<0.1	<0.5	<0.5	<0.5	<0.5	2.8	0.6	6.8	7.6	3.8	3.9	3.5	1.4	3.6	2.0	<0.5
SB11_0.9-1.1	0.9-1.1	22/03/2016	12.4	----	----	----	----	----	----	6	<1	28	16	48	4	25	<0.1	<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	
QC01	--	22/03/2016	14.4	----	----	----	----	----	----	6	<1	28	15	37	4	21	<0.1	<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	
RPD%			14.9	----	----	----	----	----	----	0.0	----	0.0	6.5	25.9	0.0	17.4	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
TRIP B/K 8	--	22/03/2016	3.7	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
SB17_0.1	0.1	4/07/2018	----	No	No	----	49.4	Mid brown sandy soil.	S.SPOONER	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
SB17_0.9	0.9	4/07/2018	26.2	----	----	----	----	----	----	10	<1	30	23	29	4	10	<0.1	<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	
QC05	--	4/07/2018	27.0	----	----	----	----	----	----	11	<1	30	24	31	4	10	<0.1	<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	
RPD%			3.0	----	----	----	----	----	----	9.5	----	0.0	4.3	6.7	0.0	0.0	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
SB18_0.2-0.3	0.2-0.3	4/07/2018	13.9	No	No	----	36.9	Mid brown sandy soil.	S.SPOONER	8	<1	20	34	206	7	255	<0.1	<0.5	<0.5	<0.5	<0.5	2.9	0.8	8.4	9.3	4.5	4.8	6.4	2.4	4.9	2.4	0.5
T.B.	--	3/07/2018	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

LEGEND
LOR-Limit of Reporting
mg/kg - milligrams per kilogram
Chromium - HIL criterion for Cr(VI) used
HSL/ESL - sand/course materials used
EIL values adopted from default or conservative values in NEPM 2013.

Table 1
Soil Analytical Results and QA/QC
Landscaped Areas - Homebush
Statewide Planning Pty Ltd
Proj # SES_442

Analyte						Total Petroleum Hydrocarbons					Total Recoverable Hydrocarbons - NEPM 2013							BTEXN						
	Benzo(g,h,i)perylene	Sum of polycyclic aromatic hydrocarbons	Benzo(a)pyrene TEQ (zero)	Benzo(a)pyrene TEQ (half LOR)	Benzo(a)pyrene TEQ (LOR)	C6 - C9 Fraction	C10 - C14 Fraction	C15 - C28 Fraction	C29 - C36 Fraction	C10 - C36 Fraction (sum)	C6 - C10 Fraction	C6 - C10 Fraction minus BTEX (F1)	>C10 - C16 Fraction	>C16 - C34 Fraction	>C34 - C40 Fraction	>C10 - C40 Fraction (sum)	>C10 - C16 Fraction minus Naphthalene (F2)	Benzene	Toluene	Ethylbenzene	meta- & para-Xylene	ortho-Xylene	Total Xylenes	Naphthalene
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	LOR	0.5	0.5	0.5	0.5	10	50	100	100	50	10	10	50	100	100	50	50	0.2	0.5	0.5	0.5	0.5	0.5	1
	HIL B	-	400	4	4	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	HSL A/B Inhalation 0-1m - sand (NEPM 2013)	-	-	-	-	-	-	-	-	-	-	45	-	-	-	-	110	0.5	160	55	-	-	40	3
	HSL B Contact (CRC 2011)	-	-	-	-	-	-	-	-	-	-	5,600	-	5,800	8,100	-	4,200	140	21,000	5,900	-	-	17,000	2,200
	EIL Urban (NEPM 2013)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	170
	ESL Urban (NEPM 2013)	-	-	-	-	-	-	-	-	-	-	180	120	300	2,800	-	-	50	85	70	105	-	-	-

Sample ID	Depth	Date																						
Retained Soils in Landscaping Areas																								
BH3_0.2-0.4	0.2-0.4	22/03/2016	<0.5	<0.5	<0.5	0.6	1.2	<10	<50	<100	<100	<50	<10	<10	<50	<100	<100	<50	<50	<0.2	<0.5	<0.5	<0.5	<0.5
BH3_1.8-2.0	1.8-2	22/03/2016	<0.5	<0.5	<0.5	0.6	1.2	<10	<50	<100	<100	<50	<10	<10	<50	<100	<100	<50	<50	<0.2	<0.5	<0.5	<0.5	<0.5
BH5_0.5-0.6	0.5-0.6	28/03/2016	3.8	38.2	4.9	4.9	4.9	<10	<50	170	160	330	<10	<10	<50	300	<100	300	<50	<0.2	<0.5	<0.5	<0.5	<0.5
BH5_2.5-2.8	2.8-2.8	28/03/2016	<0.5	<0.5	<0.5	0.6	1.2	<10	<50	<100	<100	<50	<10	<10	<50	<100	<100	<50	<50	<0.2	<0.5	<0.5	<0.5	<0.5
QC02	--	28/03/2016	<0.5	<0.5	<0.5	0.6	1.2	<10	<50	<100	<100	<50	<10	<10	<50	<100	<100	<50	<50	<0.2	<0.5	<0.5	<0.5	<0.5
RPD%			----	----	----	0	0	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
BH8_0.1	0.1	28/03/2016	1.0	8.6	1.2	1.4	1.7	<10	<50	250	380	630	<10	<10	<50	540	190	730	<50	<0.2	<0.5	<0.5	<0.5	<0.5
BH8_1.1	1.1	28/03/2016	<0.5	<0.5	<0.5	0.6	1.2	<10	<50	<100	<100	<50	<10	<10	<50	<100	<100	<50	<50	<0.2	<0.5	<0.5	<0.5	<0.5
SB11_0.3-0.5	0.3-0.5	22/03/2016	3.1	39.1	4.7	5.0	5.2	<10	<50	100	<100	100	<10	<10	<50	150	<100	150	<50	<0.2	<0.5	<0.5	<0.5	<0.5
SB11_0.9-1.1	0.9-1.1	22/03/2016	<0.5	<0.5	<0.5	0.6	1.2	<10	<50	<100	<100	<50	<10	<10	<50	<100	<100	<50	<50	<0.2	<0.5	<0.5	<0.5	<0.5
QC01	--	22/03/2016	<0.5	<0.5	<0.5	0.6	1.2	<10	<50	<100	<100	<50	<10	<10	<50	<100	<100	<50	<50	<0.2	<0.5	<0.5	<0.5	<0.5
RPD%			----	----	----	0	0	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
TRIP B/K 8	--	22/03/2016	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	<0.2	<0.5	<0.5	<0.5	<0.5
SB17_0.1	0.1	4/07/2018	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
SB17_0.9	0.9	4/07/2018	<0.5	<0.5	<0.5	0.6	1.2	<10	<50	<100	<100	<50	<10	<10	<50	<100	<100	<50	<50	<0.2	<0.5	<0.5	<0.5	<0.5
QC05	--	4/07/2018	<0.5	<0.5	<0.5	0.6	1.2	<10	<50	<100	<100	<50	<10	<10	<50	<100	<100	<50	<50	<0.2	<0.5	<0.5	<0.5	<0.5
RPD%			----	----	----	0	0	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
SB18_0.2-0.3	0.2-0.3	4/07/2018	3.5	50.8	7.0	7.0	7.0	<10	<50	220	200	420	<10	<10	<50	370	110	480	<50	<0.2	<0.5	<0.5	<0.5	<0.5
T.B.	--	3/07/2018	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	<0.2	<0.5	<0.5	<0.5	<0.5

LEGEND
LOR-Limit of Reporting
mg/kg - milligrams per kilogram
Chromium - HIL criterion for Cr(VI) used
HSL/ESL - sand/course materials used
EIL values adopted from default or conservative values in NEPM 2013.

Table 2
Soil Analytical Results and QA/QC
Loftus Lane Areas - Homebush
Statewide Planning Pty Ltd
Proj # SE5_442

Analyte Units LOR HIL D HSL D Inhalation 0-1m - sand (NEPM 2013) HSL D Contact (CRC 2011)		Moisture Content (dried @ 103°C)	Identification of Asbestos							Total Metals by ICP-AES							Polynuclear Aromatic Hydrocarbons																					
			Asbestos Detected	Asbestos (trace)	Asbestos Type	Sample weight (dry)	Description	APPROVED IDENTIFIER:	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Mercury	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b+g)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene	Sum of polycyclic aromatic hydrocarbons	Benzo(a)pyrene TEQ (zero)	Benzo(a)pyrene TEQ (half LOR)	Benzo(a)pyrene TEQ (LOR)		
			g/kg	fibres	-	g	-	-	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
			1	0.1	5	0.01	-	-	3000	900	3600	240000	1500	6000	400000	730	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	0.5	0.5	0.5	
			-	Presence	Presence	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4000	40	40	40
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NL (9)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sample ID	Depth	Date																																				
Retained Soils under Loftus Lane																																						
BH1 0.2-0.3	0.2-0.3	22/03/2016		20.2	No	----	----	49.5	Pale brown clay soil	C.OWLER	<5	<1	3	21	60	<2	<5	<0.1	<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	0.6	1.2		
BH1 1.5-1.7	1.5-1.7	22/03/2016		17.6	----	----	----	----	----	----	5	<1	16	6	31	<2	17	<0.1	<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	0.6	1.2		
									Mid brown clay soil	C.OWLER	<5	<1	12	33	30	<2	9	<0.1	<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	0.6	1.2	
BH2 0.2-0.4	0.2-0.4	22/03/2016		20.7	No	----	----	37.3	----	----	<5	<1	19	6	16	<2	8	<0.1	<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	0.6	1.2	
BH2 3.8-4.0	3.8-4.0	22/03/2016		20.5	----	----	----	----	----	----	<5	<1	19	6	16	<2	8	<0.1	<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	0.6	1.2	
BH4 0.3	0.3	22/03/2016		25.0	No	----	----	30.1	Pale brown clay soil	C.OWLER	<5	<1	22	18	22	<2	5	<0.1	<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	0.6	1.2		
									Mid brown clay soil with grey rocks	G.MORGAN	<5	<1	22	18	22	<2	5	<0.1	<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	0.6	1.2		
BH7 0.2	0.2	28/03/2016		21.4	No	----	----	33.1	Mid brown clay soil with grey rocks	G.MORGAN	11	<1	27	70	428	12	425	0.4	4.6	7.2	1.5	9.3	60.6	17.5	69.2	64.4	37.1	32.7	32.6	11.8	35.1	18.0	4.8	23.0	429	50.4	50.4	50.4
SB12 0.1	0.1	4/07/2018		22.3	No	No	----	29.7	Mid brown sandy soil.	S.SPOONER	6	<1	26	20	18	3	6	<0.1	<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	0.6	1.2	
SB12 0.4-0.5	0.4-0.5	4/07/2018		23.7	----	----	----	----	----	----	6	<1	16	22	18	<2	<5	<0.1	<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	0.6	1.2	
QC04	--	4/07/2018		23.6	----	----	----	----	----	----	6	<1	19	21	20	<2	<5	<0.1	<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	0.6	1.2	
		RPD%		0.4	----	----	----	----	----	----	0	----	17.1	4.7	10.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	0	0		
SB13 0.1-0.2	0.1-0.2	4/07/2018		17.5	----	----	----	----	----	----	9	<1	31	37	176	10	261	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	0.8	<0.5	<0.5	0.7	<0.5	0.5	<0.5	<0.5	2.7	0.6	0.9	1.2
SB13 0.8	0.8	4/07/2018		22.6	----	----	----	----	----	----	<5	<1	27	18	25	5	7	<0.1	<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	0.6	1.2	

LEGEND
LOR-Limit of Reporting
mg/kg - milligrams per kilogram
Chromium - HIL criterion for Cr(VI) used
HSL/ESL - sand/course materials used
EILs adopted from default or conservative values in NEPM 2013

Table 2
Soil Analytical Results and QA/QC
Loftus Lane Areas - Homebush
Statewide Planning Pty Ltd
Proj # SE5_442

Analyte Units LOR HIL D HSL D Inhalation 0-1m - sand (NEPM 2013) HSL D Contact (CRC 2011)	Total Petroleum Hydrocarbons					Total Recoverable Hydrocarbons - NEPM 2013							BTEXN					Monocyclic Aromatic Hydrocarbons										Oxygenated Compounds					Fumigants						
	C6- C9 Fraction	C10- C14 Fraction	C15- C28 Fraction	C29- C36 Fraction	C10- C36 Fraction (sum)	C6- C10 Fraction	C6- C10 Fraction minus BTEX (F1)	C10- C16 Fraction	C16- C34 Fraction	C34- C40 Fraction	C10- C40 Fraction (sum)	C10- C16 Fraction minus Naphthalene (F2)	Benzene	Toluene	Ethylbenzene	meta- & para-Xylene	ortho-Xylene	Total Xylenes	Naphthalene	Styrene	Isopropylbenzene	n-Propylbenzene	1,3,5-Trimethylbenzene	sec-Butylbenzene	1,2,4-Trimethylbenzene	tert-Butylbenzene	p-Isopropyltoluene	n-Butylbenzene	Vinyl Acetate	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	2-Hexanone (MBK)	Carbon disulfide	2,2-Dichloropropane	1,2-Dichloropropane	1,1,2-Trichloroethylene	trans-1,3-Dichloropropylene	1,2-Dibromoethane (EDB)	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	10	50	100	100	50	10	10	50	100	100	50	50	0.2	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	5	5	5	0.5	0.5	0.5	0.5	0.5	0.5	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	260	-	-	-	-	NL(560)	3	NL(560)	NL(64)	-	-	230	NL(9)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sample ID	Depth	Date
Retained Soils under Loftus Lane		
BH1 0.2-0.3	0.2-0.3	22/03/2016
BH1 1.5-1.7	1.5-1.7	22/03/2016
BH2 0.2-0.4	0.2-0.4	22/03/2016
BH2 3.8-4.0	3.8-4.0	22/03/2016
BH4 0.3	0.3	22/03/2016
BH7 0.2	0.2	28/03/2016
SB12 0.1	0.1	4/07/2018
SB12 0.4-0.5	0.4-0.5	4/07/2018
QC04	--	4/07/2018
RPD%		
SB13 0.1-0.2	0.1-0.2	4/07/2018
SB13 0.8	0.8	4/07/2018

LEGEND
LOR-Limit of Reporting
mg/kg - milligrams per kilogram
Chromium - HIL criterion for Cr(VI) used
HSL/ESL - sand/course materials used
EILs adopted from default or conservative values in NEPM 2013

[illegible][illegible]

LEGEND

LOR-Limit of Reporting

mg/kg - milligrams per kilogram

Chromium - HIL criterion for Cr(VI) used

HSL/ESL - sand/course materials used

EILs adopted from default or conservative values in NEPM 2013

Analyte	Moisture Content (dried @ 103°C)	Identification of Asbestos						Total Metals by ICP-AES								Polynuclear Aromatic Hydrocarbons																Total Petroleum Hydrocarbons									
		Asbestos Detected	Asbestos (trace)	Asbestos Type	Sample weight (dry)	Description	APPROVED IDENTIFIER:	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Mercury	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benz(b)fluoranthene	Benz(k)fluoranthene	Benz(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Benz(g,h,i)perylene	Sum of polycyclic aromatic hydrocarbons	Benz(a)pyrene TEQ (zero)	Benz(a)pyrene TEQ (half LOR)	Benz(a)pyrene TEQ (LOR)	C6 - C9 Fraction	C10 - C14 Fraction	C15 - C18 Fraction	C19 - C36 Fraction	C10 - C36 Fraction (sum)	
Units	%	g/kg	fibres	-	g	-	-	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR	1	0.1	5	-	0.01	-	-	5	1	2	5	5	2	5	0.1	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	0.5	10	50	100	100	50		
CT1 (EPA 2014)	-	-	-	-	-	-	-	100	20	100	-	100	40	-	4	-	-	-	-	-	-	-	-	-	-	-	-	0.8	-	-	-	-	200	-	-	-	650	-	-	-	10000
CT2 (EPA 2014)	-	-	-	-	-	-	-	400	80	400	-	400	160	-	16	-	-	-	-	-	-	-	-	-	-	-	-	3.2	-	-	-	-	800	-	-	-	2600	-	-	-	40000
SCC1 (EPA 2014)	-	-	-	-	-	-	-	500	100	1900	-	1500	1050	-	50	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-	200	-	-	-	650	-	-	-	10000
SCC2 (EPA 2014)	-	-	-	-	-	-	-	2000	400	7600	-	6000	4200	-	200	-	-	-	-	-	-	-	-	-	-	-	-	23	-	-	-	-	800	-	-	-	2600	-	-	-	40000

Sample ID	Depth	Date																																												
Soils to be Excavated for Basement Areas																																														
BH6 0.4	0.4	28/03/2016	25.6	No	No	----	40.8	Mid brown clay soil with grey rocks	G.MORGAN	6	<1	29	23	29	4	48	<0.1	<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	0.6	1.2	<10	<50	<100	<100	<50					
BH6 3.0	3	28/03/2016	10.2	----	----	----	----	----	----	8	<1	7	39	13	<2	<5	<0.1	<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	0.6	1.2	<10	<50	<100	<100	<50				
BH9 0.2	0.2	28/03/2016	16.0	No	No	----	59.6	Mid brown clay soil with grey rocks	C.OWLER	6	<1	8	68	667	2	133	<0.1	<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	0.6	0.6	1.1	1.4	<10	<50	<100	<100	<50		
SB10 0.3-0.4	0.3-0.7	22/03/2016	23.3	No	No	----	22.9	Mid brown clay soil with red rocks	C.OWLER	5	<1	22	18	22	3	8	<0.1	<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	<0.5	<0.5	0.6	1.2	<10	<50	<100	<100	<50		
TRIP B/K 8	--	22/03/2016	3.7	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----			
SB14 0.1	0.1	4/07/2018	----	No	No	----	31.1	Mid brown sandy soil.	S.SPOONER	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----		
SB14 0.4	0.4	4/07/2018	15.1	----	----	----	----	----	----	<5	<1	13	14	20	5	41	<0.1	<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	<0.5	<0.5	0.6	1.2	<10	<50	<100	<100	<50		
SB14 0.8	0.8	4/07/2018	23.4	----	----	----	----	----	----	9	<1	19	19	21	<2	<5	<0.1	<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	<0.5	<0.5	<0.5	0.6	1.2	<10	<50	<100	<100	<50	
SB15 0.1-0.2	0.1-0.2	4/07/2018	24.0	No	No	----	41.1	Mid brown sandy soil.	S.SPOONER	<5	<1	5	50	36	5	95	0.2	<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	<0.5	<0.5	<0.5	0.6	1.2	<10	<50	170	360	530	
SB16 0.2-0.3	0.2-0.3	4/07/2018	----	No	No	----	27.6	Mid grey sandy soil.	S.SPOONER	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	
SB16 0.5-0.6	0.5-0.6	4/07/2018	23.3	----	----	----	----	----	----	<5	<1	4	35	21	12	25	<0.1	<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	<0.5	<0.5	<0.5	0.6	1.2	<10	<50	<100	<100	<50	
SB16 0.8	0.8	4/07/2018	20.9	----	----	----	----	----	----	9	<1	34	15	27	5	9	<0.1	<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	<0.5	<0.5	<0.5	0.6	1.2	<10	<50	<100	<100	<50	
SB19 0.1-0.2	0.1-0.2	4/07/2018	19.3	No	No	----	35.6	Mid brown sandy soil.	S.SPOONER	<5	<1	15	24	38	7	56	<0.1	<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	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<10	<50	<100	<100	<50
T.B.	--	3/07/2018	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	
FC01	--	4/07/2018	----	No	----	----	5.26	One piece of cement sheeting	A. SMYLIE	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	

Analyte	Total Recoverable Hydrocarbons - NEPM 2013							BTEXN							Monocyclic Aromatic Hydrocarbons										Oxygenated Compounds					Fumigants				Halogenated Aliphatic Compounds										
	C6 - C10 Fraction	C6 - C10 Fraction minus BTEX (F1)	C10 - C16 Fraction	C16 - C34 Fraction	C34 - C40 Fraction	C10 - C40 Fraction (sum)	C10 - C16 Fraction minus Naphthalene (F2)	Benzene	Toluene	Ethylbenzene	meta- & para-Xylene	ortho-Xylene	Total Xylenes	Naphthalene	Styrene	Isopropylbenzene	n-Propylbenzene	1,3,5-Trimethylbenzene	sec-Butylbenzene	1,2,4-Trimethylbenzene	tert-Butylbenzene	p-Isopropyltoluene	n-Butylbenzene	Vinyl Acetate	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	2-Hexanone (MBK)	Carbon disulfide		2,2-Dichloropropane	1,2-Dichloropropane	cis-1,3-Dichloropropylene	trans-1,3-Dichloropropylene	1,2-Dibromoethane (EDB)	Dichlorodifluoromethane	Chloromethane	Vinyl chloride	Bromomethane	Chloroethane	Trichlorofluoromethane	1,1-Dichloroethene	Iodomethane		
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR	10	10	50	100	100	50	50	0.2	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	5	5	5	0.5	0.5	0.5	0.5	0.5	0.5	5	5	5	5	5	5	5	5	0.5	0.5	
CT1 (EPA 2014)								10	288	600			1000		60	-	-	-	-	-	-	-	-	-	4000	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	14	-		
CT2 (EPA 2014)								40	1152	2400			4000		240	-	-	-	-	-	-	-	-	-	16000	-	-	-	-	-	-	-	-	-	-	16	-	-	-	56	-			
SCC1 (EPA 2014)								18	518	1080			1800		108	-	-	-	-	-	-	-	-	-	7200	-	-	-	-	-	-	-	-	-	-	7.2	-	-	-	25	-			
SCC2 (EPA 2014)								72	2073	4320			7200		432	-	-	-	-	-	-	-	-	-	28800	-	-	-	-	-	-	-	-	-	-	28.8	-	-	-	100	-			

Sample ID	Depth	Date																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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BH6 0.4	0.4	28/03/2016	<10	<10	<50	<100	<100	<50	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Table 4
TCLP Analytical Results
Homebush
Statewide Planning Pty Ltd
Proj # SES_442

			Leachable Metals by ICPAES					Benzo(a)pyrene
Analyte			Arsenic	Cadmium	Lead	Nickel	Mercury	
Units			mg/L	mg/L	mg/L	mg/L	mg/L	
LOR			0.1	0.05	0.1	0.1	0.001	
TCLP1 (EPA 2014)			5	1	5	2	0.2	
TCLP2 (EPA 2014)			20	4	20	8	0.8	160
Sample ID	Depth	Sample date						
BH2_3.8-4.0	3.8-4.0	22/03/2016	<0.1	<0.05	<0.1	<0.1	<0.0010	<0.5
BH6_0.4	0.4	28/03/2016	<0.1	<0.05	<0.1	<0.1	<0.0010	<0.5
SB16_0.5-0.6	0.5-0.6	4/07/2018	<0.1	<0.05	<0.1	<0.1	<0.0010	<0.5
SB18_0.2-0.3	0.2-0.3	4/07/2018	<0.1	<0.05	<0.1	<0.1	<0.0010	<0.5

LEGEND
 LOR-Limit of Reporting
 mg/L - milligrams per Litre

Table 5
Groundwater Analytical Results
Homebush
Statwide Planning Pty Ltd
Proj # SES_442

Sample ID	Date	Dissolved Metals by ICP-MS								Monocyclic Aromatic Hydrocarbons								Oxygenated Compounds				Fumigants				Halogenated Compounds																		
		Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Mercury	Styrene	Isopropylbenzene	n-Propylbenzene	1,3,5-Trimethylbenzene	sec-Butylbenzene	1,2,4-Trimethylbenzene	tert-Butylbenzene	p-Isopropyltoluene	n-Butylbenzene	Vinyl Acetate	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	2-Hexanone (MBK)	Carbon disulfide	2,2-Dichloropropane	1,2-Dichloropropane	cis-1,3-Dichloropropylene	trans-1,3-Dichloropropylene	1,2-Dibromoethane (EDB)	Dichlorodifluoromethane	Chloromethane	Vinyl chloride	Bromomethane	Chloroethane	Trichlorofluoromethane	1,1-Dichloroethene	Iodomethane	trans-1,2-Dichloroethene	1,1-Dichloroethane	cis-1,2-Dichloroethene	1,1,1-Trichloroethane	1,1-Dichloropropylene			
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L			
		Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L		
		LOR	0.001	0.0001	0.001	0.001	0.001	0.001	0.005	0.0001	5	5	5	5	5	5	5	5	5	50	50	50	50	5	5	5	5	5	5	50	50	50	50	50	50	50	5	5	5	5	5	5	5	5
ANZECC 95% MW (FW*)	0.013	0.0007	0.0044	0.0013	0.0044	0.007	0.015	0.0001	-	-	-	-	-	-	-	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
HSL A/B Inhalation 2-4m - sand	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
BH1	05/04/2016	<0.001	0.0576	<0.001	0.026	<0.001	0.182	0.397	<0.0001	<5	<5	<5	<5	<5	<5	<5	<5	<5	<50	<50	<50	<50	<5	<5	<5	<5	<5	<5	<50	<50	<50	<50	<50	<50	<50	<50	<5	<5	<5	<5	<5	<5	<5	
BH4	05/04/2016	<0.001	0.0004	<0.001	0.002	<0.001	0.057	0.114	<0.0001	<5	<5	<5	<5	<5	<5	<5	<5	<5	<50	<50	<50	<50	<5	<5	<5	<5	<5	<5	<50	<50	<50	<50	<50	<50	<50	<50	<5	<5	<5	<5	<5	<5	<5	
QA	05/04/2016	<0.001	0.0004	<0.001	0.002	<0.001	0.060	0.117	<0.0001	<5	<5	<5	<5	<5	<5	<5	<5	<5	<50	<50	<50	<50	<5	<5	<5	<5	<5	<5	<50	<50	<50	<50	<50	<50	<50	<50	<5	<5	<5	<5	<5	<5	<5	
	RPD%	----	0	----	0	----	5.1	2.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	
BH5	05/04/2016	<0.001	0.0010	<0.001	<0.001	<0.001	0.316	0.872	<0.0001	<5	<5	<5	<5	<5	<5	<5	<5	<5	<50	<50	<50	<50	<5	<5	<5	<5	<5	<5	<50	<50	<50	<50	<50	<50	<50	<50	<5	<5	<5	<5	<5	<5	<5	
BH6	05/04/2016	<0.001	0.0001	<0.001	<0.001	<0.001	0.010	0.014	<0.0001	<5	<5	<5	<5	<5	<5	<5	<5	<5	<50	<50	<50	<50	<5	<5	<5	<5	<5	<5	<50	<50	<50	<50	<50	<50	<50	<50	<5	<5	<5	<5	<5	<5	<5	
TB	05/04/2016	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

LEGEND
LOR - limit of reporting
mg/l - milligrams per litre
ug/l - micrograms per litre
HSL values - coarse materials
ANZECC 95% protection used
Freshwater adopted where no marine water value
ANZECC 95% not corrected for water hardness

Table 5
Groundwater Analytical Results
Homebush
Statwide Planning Pty Ltd
Proj # SES_442

Sample ID	Date	saturated Aliphatic Compounds																Halogenated Aromatic Compounds										Trihalomethanes				Polynuclear Aromatic Hydrocarbons											
		Carbon Tetrachloride	1,2-Dichloroethane	Trichloroethene	Dibromomethane	1,1,2-Trichloroethane	1,3-Dichloropropane	Tetrachloroethene	1,1,1,2-Tetrachloroethane	trans-1,4-Dichloro-2-butene	cis-1,4-Dichloro-2-butene	1,1,2,2-Tetrachloroethane	1,2,3-Trichloropropane	Pentachloroethane	1,2-Dibromo-3-chloropropane	Hexachlorobutadiene	Chlorobenzene	Bromobenzene	2-Chlorotoluene	4-Chlorotoluene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	1,2-Dichlorobenzene	1,2,4-Trichlorobenzene	1,2,3-Trichlorobenzene	Chloroform	Bromodichloromethane	Dibromochloromethane	Bromoform	Naphthalene	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benz(b)fluoranthene		
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L			
		LOR	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	1	1	1	1	1	1	1	1	1	1		
		ANZECC 95% MW (FW*)	-	-	-	-	1900	-	-	-	-	-	-	-	-	-	-	-	-	-	-	260*	60*	160*	20	3*	370*	-	-	-	-	50	-	-	-	0.6 (indic)	-	-	-	-	-	-	
		HSL A/B Inhalation 2-4m - sand	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	170	170	-	-	-	-	-	-	-	-	-	-	
		RPD%	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
BH1	05/04/2016	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
BH4	05/04/2016	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
QA	05/04/2016	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	RPD%	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
BH5	05/04/2016	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
BH6	05/04/2016	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	<S	9	<S	<S	<S	<S	<1.0	<1.0	<1.0	<1.0	1.8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
TB	05/04/2016	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

LEGEND
LOR - limit of reporting
mg/l - milligrams per litre
ug/l - micrograms per litre
HSL values - coarse materials
ANZECC 95% protection used
Freshwater adopted where no marine water value
ANZECC 95% not corrected for water hardness

Table 5
Groundwater Analytical Results
Homebush
Statwide Planning Pty Ltd
Proj # SES_442

Sample ID	Date	Analyte	Total Petroleum Hydrocarbons										Total Recoverable Hydrocarbons - NEPM 2013 Fractions						TPH - Silica gel cleanup				TRH - Silica gel cleanup				BTEXN											
			Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene	Sum of polycyclic aromatic hydrocarbons	Benzo(a)pyrene TEQ (zero)	C6 - C9 Fraction	C10 - C14 Fraction	C15 - C28 Fraction	C29 - C36 Fraction	C10 - C36 Fraction (sum)	C6 - C10 Fraction	C6 - C10 Fraction minus BTEX (F1)	>C10 - C16 Fraction	>C16 - C34 Fraction	>C34 - C40 Fraction	>C10 - C40 Fraction (sum)	>C10 - C16 Fraction minus Naphthalene (F2)	C10 - C14 Fraction	C15 - C28 Fraction	C29 - C36 Fraction	C10 - C36 Fraction (sum)	>C10 - C16 Fraction	>C16 - C34 Fraction	>C34 - C40 Fraction	>C10 - C40 Fraction (sum)	Benzene	Toluene	Ethylbenzene	meta- & para-Xylene	ortho-Xylene	Total Xylenes	Naphthalene		
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
			LOR	1	0.5	1	1	1	0.5	0.5	20	50	100	50	50	20	20	100	100	100	100	100	50	100	50	50	100	100	100	100	1	2	2	2	2	2	5	
			ANZECC 95% MW (FW*)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500	-	-	-	-	-	-	-	
			HSL A/B Inhalation 2-4m - sand	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	-	-	-	-	1000	-	-	-	-	1000	-	-	-	800	NL(61000)	NL(3900)	-	-	NL(21000)	NL(170)	
			BH1	05/04/2016	<1.0	<0.5	<1.0	<1.0	<1.0	<0.5	<0.5	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	----	----	----	----	----	----	----	<1	<2	<2	<2	<2	<2	<2	<5
			BH4	05/04/2016	<1.0	<0.5	<1.0	<1.0	<1.0	<0.5	<0.5	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	----	----	----	----	----	----	----	<1	<2	<2	<2	<2	<2	<2	<5
			QA	05/04/2016	<1.0	<0.5	<1.0	<1.0	<1.0	<0.5	<0.5	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100	----	----	----	----	----	----	----	<1	<2	<2	<2	<2	<2	<2	<5
				RPD%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BH5	05/04/2016	<1.0	<0.5	<1.0	<1.0	<1.0	<0.5	<0.5	<20	120	1320	620	2060	<20	<20	210	1540	420	2170	210	<50	860	510	1370	<100	1070	510	1580	<1	4	<2	<2	<2	<2	<2	<5		
BH6	05/04/2016	<1.0	<0.5	<1.0	<1.0	<1.0	1.8	<0.5	<20	160	1030	470	1660	<20	<20	220	1190	310	1720	220	<50	680	420	1100	<100	860	420	1280	<1	4	<2	<2	<2	<2	<2	<5		
TB	05/04/2016	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	<1	<2	<2	<2	<2	<2	<2	<5			

LEGEND
LOR - limit of reporting
mg/l - milligrams per litre
ug/l - micrograms per litre
HSL values - coarse materials
ANZECC 95% protection used
Freshwater adopted where no marine water value
ANZECC 95% not corrected for water hardness

Appendix C Borelogs

BOREHOLE LOG

D. Katauskas

Consulting Geotechnical Engineer

No: 1

Client:		Statewide Planning Pty Ltd				Date:		22 /03/ 2016				
Project:		Proposed Residential Flat Development				Job No:		971				
Location:		10-16 Loftus Cres & 88-92 Parramatta Rd, Homebush NSW										
Method:		Geo 205 Drill Rig		RL:		7.2 m approx		Logged:		DK		
				Datum:		AHD		Checked:		DK		
Groundwater	Record	Sample	Field Tests	Depth (m)	Graphic Log	Unified Classification	Description	Moisture Condition / Weathering	Strength	Relative Density	Hand Penetrometer Readings (kPa)	Remarks
							CONCRETE					Pavement
							FILL: shales clay: grey	M				
				1		CL	SILT CLAY: medium plasticity dark grey grading to	M7PL	F/S			
				2		CH	SILT CLAY: high plasticity dark brown & grey then mottled red brown and grey	M&H	VSE			
			N=11 (3,56)									
				3								
			N=14 (3,4,10)									
				4								
				5			with some ironstone bands					
			N=22 (5,9,13)									
				6			SHALE: brown & grey	EW	VL			
				7			as above but more grey some medium strong bands	DW	L			
				8								

END BHE 8.0m

BOREHOLE LOG

D. Katauskas

Consulting Geotechnical Engineer

No: 2

Client:		Statewide Planning Pty Ltd				Date:		22 /03/ 2016				
Project:		Proposed Residential Flat Development				Job No:		971				
Location:		10-16 Loftus Cres & 88-92 Parramatta Rd, Homebush NSW										
Method:		Geo 205 Drill Rig		RL:		7.2 m approx		Logged:		DK		
				Datum:		AHD		Checked :		DK		
Groundwater	Record	Sample	Field Tests	Depth (m)	Graphic Log	Unified Classification	Description	Moisture Condition / Weathering	Strength	Relative Density	Hand Penetrometer Readings (kPa)	Remarks
							CONCRETE					Pavement
			N=4 (2,2,2)	1			FILL: shales clay: grey and brown	M				
						CL	SILTY CLAY: low plasticity	M>PL	F			
			N=11 (3,5,6)	2		CH	SILTY CLAY: high plasticity grey some brown some ironstone gravel	M=PL	VS _t			
				3								
							as above but grey with some red & brown mottling					
			N=15 (9,9,6)	4			some ironstone bands					
							END BHE 4.0m					
				5								
				6								
				7								
				8								

BOREHOLE LOG

D. Katauskas

Consulting Geotechnical Engineer

No: 3

Client: Statewide Planning Pty Ltd							Date: 22 /03/ 2016				
Project: Proposed Residential Flat Development							Job No: 971				
Location: 10-16 Loftus Cres & 88-92 Parramatta Rd, Homebush NSW											
Method: Geo 205 Drill Rig							RL: 8.8 m approx Datum: AHD		Logged: DK Checked: DK		
Groundwater	Record	Sample	Field Tests	Depth (m)	Graphic Log	Unified Classification	Description	Moisture Condition / Weathering	Strength/ Relative Density	Hand Penetrometer Readings (kPa)	Remarks
							PAVERS ON GRAVEL BASE				DRIVEWAY
				1		CL	FILL: silty clay: red brown & grey	M			
		N=14 (3,4,10)		2		CH	SILTY CLAY: medium plasticity mottled grey & red brown	M=PL	SL		
				3			as above high plasticity grey with some red-brown mottling	M=PL	VSL		
				4							
		N=24 (10,12,12)		5			SHALE: brown & grey	SN	VL to L		
				6			becoming more grey				
		N>30 23, 30/10mm		7			as above	SN	M		INCREASE IN AUGERING RESIST
				8			END BHE 7.0m				

BOREHOLE LOG

D. Katauskas

Consulting Geotechnical Engineer

No: 4

Client: Statewide Planning Pty Ltd						Date: 22 /03/ 2016				
Project: Proposed Residential Flat Development						Job No: 971				
Location: 10-16 Loftus Cres & 88-92 Parramatta Rd, Homebush NSW										
Method: Geo 205 Drill Rig					RL: 9.0 m approx Datum: AHD		Logged: DK		Checked: DK	
Groundwater Record	Sample	Field Tests	Depth (m)	Graphic Log	Unified Classification	Description	Moisture Condition / Weathering	Strength Relative Density	Hand Penetrometer Readings (kPa)	Remarks
Dry During Rigging				0.00 3.00		Road base gravel				Driveway
			1		CH	SLTY CLAY: high plasticity mottled red brown grey	MEPL	Yst		WMW INSTALLED
		N>>3/ 20, 31 / 100mm	2			SHALE: brown grey	EW	VL		
			3				DW	L		
			4							
			5							
			6			as above but more darkish grey: some medium strong bands	DW	L/ M		
			7							
			8			END BHE 7.5m				

BOREHOLE LOG

D. Katauskas

Consulting Geotechnical Engineer

No: 5 1/2

Client: Statewide Planning Pty Ltd						Date: 29 /03/ 2016						
Project: Proposed Residential Flat Development						Job No: 971						
Location: 10-16 Loftus Cres & 88-92 Parramatta Rd, Homebush NSW												
Method: Landcruiser Mounted Drill Rig					RL: 7.7 m approx Datum: AHD		Logged: DK		Checked: DK			
Groundwater	Record	Sample	Field Tests	Depth (m)	Graphic Log	Unified Classification	Description	Moisture Condition / Weathering	Strength	Relative Density	Hand Penetrometer Readings (kPa)	Remarks
							CONCRETE					
							FILL: clayey gravel base					
				1		CL	SILT CLAY: medium plasticity dark brown	MPL	F			WMW INSTALLED
		N=5 (1,2,3)		2		CH	as above but high plasticity mottled red brown & grey		SE			
				3					L			
		N=14 (4,6,8)		4					H			
				5								
				6			SHALE: brown & darkish grey	DN			L	INCREASE IN AUGERING RESISTANCE
				7							M	
				8			REFER TO CORED B.H. LOG					

Consulting Geotechnical Engineer

5 2/2

Datum: AHD

Water Loss/Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, structure, minor components	Weathering	Strength	POINT LOAD INDEX STRENGTH I _s (50)	DEFECT DETAILS	
								DEFECT SPACING (mm)	DESCRIPTION Type, inclination, thickness planarity, roughness, coating
		5							
		6							
		7		START CORING @ 7.0m					
		8		SHALE dark grey some brown iron- staining at joints	DW M to F		x x x		60° JOINT
		9		END BHK @ 9.0m					
		10							
		11							
		12							

BOREHOLE LOG

D. Katauskas

Consulting Geotechnical Engineer

No: 6 1/2

Client: Statewide Planning Pty Ltd							Date: 29 /03/ 2016					
Project: Proposed Residential Flat Development							Job No: 971					
Location: 10-16 Loftus Cres & 88-92 Parramatta Rd, Homebush NSW												
Method: Landcruiser Mounted Drill Rig							RL: 7.7 m approx		Logged: DK		Checked: DK	
							Datum: AHD					
Groundwater	Record	Sample	Field Tests	Depth (m)	Graphic Log	Unified Classification	Description		Moisture Condition / Weathering	Strength/ Relative Density	Hand Penetrometer Readings (kPa)	Remarks
OK During Augering						CL	CONCRETE OVER BLACK PAVING					
				1		CH	SILT CLAY: medium plasticity dark grey & brown	M>PL	F			Fill.??
		N=7 (3,3,4)					SILT CLAY: high plasticity mottled brown & red brown	M=PL	VST			Monitoring well installed
				2					L			
		N>20 12.20/150mm		3			as above with iron stone gravel bands		H			
				4		mottled grey and red brown						

Consulting Geotechnical Engineer

Borehole No:
6 2/2

Date Drilled: 29/ 03/ 2016

Job No: 971

R.L.Surface: Approx. 8.1 m

Datum: AHD

Water Loss/Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, structure, minor components	Weathering	Strength	POINT LOAD INDEX STRENGTH I _s (50)	DEFECT DETAILS	
								DEFECT SPACING (mm)	DESCRIPTION Type, inclination, thickness planarity, roughness, coating
		5							
		6		START CORING @ 5.7m SHALE brown & grey: fractured	DW	VL			
		7							
		8		dark grey	DW	L			
		9			F	M			
		10		END Bore 9.0m					
		11							
		12							



BOREHOLE LOG

Sheet 1 of 1

CLIENT: Statewide Planning Pty Ltd				JOB NUMBER: SES_442			
PROJECT: Stage 2 Contamination Assessment				DATE COMMENCED: 28/3/16			
LOCATION: Loftus Crescent & Parramatta Road, Homebush NSW				DATE COMPLETED: 28/3/16			
DRILL CONTRACTOR: N/A				LOGGED BY: A.S.			
Drill Model:		Hole Angle: 90		deg. Bore Size: 100mm		RL:	
Drilling Fluid:		Orientation:		deg. Co-ords:			
Method/ Casing	Depth (m)	Graphic Log USCS Classification	Material Description type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency	PID	Sampling insitu testing, groundwater observations/regime, well construction details, additional information
Hand auger			Fill: Roadbase.				
			Fill: Clay, medium plasticity, charcoal gravels.	M	F	0.1	✗ BH7_0.2
	0.5		Natural: Silty Clay, medium plasticity, dark brown.	M	F		
			Clay, med/high plasticity, brown/green colouring.	M	St	0.0	✗ BH7_0.9
	1.0		End of hole at 1.1m.				
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						
	4.0						
	4.5						
	5.0						



Borehole No:
BH8

BOREHOLE LOG

Sheet 1 of 1

CLIENT: Statewide Planning Pty Ltd				JOB NUMBER: SES_442			
PROJECT: Stage 2 Contamination Assessment				DATE COMMENCED: 28/3/16			
LOCATION: Loftus Crescent & Parramatta Road, Homebush NSW				DATE COMPLETED: 28/3/16			
DRILL CONTRACTOR: N/A				LOGGED BY: A.S.			
Drill Model:		Hole Angle: 90		deg. Bore Size: 100mm		RL:	
Drilling Fluid:		Orientation:		deg. Co-ords:			
Method/ Casing	Depth (m)	Graphic Log USCS Classification	Material Description type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency	PID	Sampling Field Records insitu testing, groundwater observations/regime, well construction details, additional information
Hand auger	0.5		Fill: Silty sand, loose, dark brown, fine sand component.	M	L	0.0	✗ BH8_0.1
			Sand, brown, fine grained.				
			Crushed sandstone, black gravels (ash) layer 10cm thick.				
	1.0		Natural: Silty Clay, low plasticity, dark brown. Increased clay content, low plasticity, lighter brown.	M	F		✗ BH8_1.1
			End of hole at 1.1m.			0.0	
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						
	4.0						
	4.5						
	5.0						

Produced By: A.S.
Checked By: A.S.

Document No:



Borehole No:
BH9

BOREHOLE LOG

Sheet 1 of 1

CLIENT: Statewide Planning Pty Ltd				JOB NUMBER: SES_442			
PROJECT: Stage 2 Contamination Assessment				DATE COMMENCED: 28/3/16			
LOCATION: Loftus Crescent & Parramatta Road, Homebush NSW				DATE COMPLETED: 28/3/16			
DRILL CONTRACTOR: N/A				LOGGED BY: A.S.			
Drill Model:		Hole Angle: 90		deg. Bore Size: 100mm		RL:	
Drilling Fluid:		Orientation:		deg. Co-ords:			
Method/ Casing	Depth (m)	Graphic Log USCS Classification	Material Description type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency	PID	Sampling Field Records insitu testing, groundwater observations/regime, well construction details, additional information
Hand auger			Grass and topsoil.				
	0.5		Fill: Gravelly Clay, low plasticity, brown, friable.	D-M	S	0.0	✗ BH9_0.2
	1.0		Natural: Silty Clay, low plasticity, dark brown. Increased clay content, low plasticity, lighter brown.	M	F	0.0	✗ BH9_1.0
	5.0		End of hole at 1.0m.				

Produced By: A.S.
Checked By: A.S.

Document No:



Borehole No:
SB10

BOREHOLE LOG

Sheet 1 of 1

CLIENT: Statewide Planning Pty Ltd				JOB NUMBER: SES_442			
PROJECT: Stage 2 Contamination Assessment				DATE COMMENCED: 22/3/16			
LOCATION: Loftus Crescent & Parramatta Road, Homebush NSW				DATE COMPLETED: 22/3/16			
DRILL CONTRACTOR: N/A				LOGGED BY: A.S.			
Drill Model:				Hole Angle: 90		deg. Bore Size: 100mm RL:	
Drilling Fluid:				Orientation:		deg. Co-ords:	
Method/ Casing	Depth (m)	Graphic Log USCS Classification	Material Description type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency	PID	Sampling insitu testing, groundwater observations/regime, well construction details, additional information
Hand auger			Cobblestone surface.				
			Fill: Clay mixture with black gravels.	M	F		
	0.5		Clay matrix with minor gravels, light brown.			0.0	✗ SB10_0.3-0.4
			Natural: Silty Clay, low plasticity, brown.	M	F		
						0.0	✗ SB10_0.8
	1.0		End of hole at 0.8m.				
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						
	4.0						
	4.5						
	5.0						

Produced By: A.S.
Checked By: A.S.

Document No:



Borehole No:
SB11

BOREHOLE LOG

Sheet 1 of 1

CLIENT: Statewide Planning Pty Ltd				JOB NUMBER: SES_442			
PROJECT: Stage 2 Contamination Assessment				DATE COMMENCED: 22/3/16			
LOCATION: Loftus Crescent & Parramatta Road, Homebush NSW				DATE COMPLETED: 22/3/16			
DRILL CONTRACTOR: N/A				LOGGED BY: A.S.			
Drill Model:		Hole Angle: 90		deg. Bore Size: 100mm		RL:	
Drilling Fluid:		Orientation:		deg. Co-ords:			
Method/ Casing	Depth (m)	Graphic Log USCS Classification	Material Description type, colour/mottling, plasticity/particle size, secondary/minor components, soil origin	Moisture	Consistency	PID	Sampling in situ testing, groundwater observations/regime, well construction details, additional information
Hand auger			Grass and topsoil.				
			Fill: Silty Clay matrix, minor gravels, dark brown, low plasticity.	M	F		
	0.5		Becoming clay/gravel mixture, dark brown gravels.			0.0	✗ SB11_0.3-0.5
			Natural: Silty Clay, low plasticity, brown.	M	F		
	1.0		Becoming more gravelly, dry and yellowing.			0.0	✗ SB11_0.9-1.1 (QC01)
			End of hole at 1.1m.				
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						
	4.0						
	4.5						
	5.0						

Produced By: A.S.
Checked By: A.S.

Document No:



Sullivan Environmental Sciences Pty Ltd
PO Box 5248
Turramurra NSW 2074

Log of Borehole: SB12

Project No.: SES_442

Project: Pacific Plan Statewide - Updated Phase 2

X Coordinate: 0

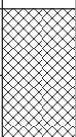
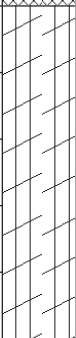
Y Coordinate: 0

Location: Knight Steet Homebush

Elevation: 0

Total Depth: 0.7m

Project Manager: A Sullivan

SUBSURFACE PROFILE			SAMPLE			Well Completion Details	Additional Observations
Depth (m)	Symbol	Description	Number	Type	PID		
0		Ground Surface					
		FILL Clay and ash slag mixture, moist, stiff clay, high plasticity		D			
		NATURAL Silty Clay; medium plasticity with reddish hues, moist, firm					
		Becoming shaley with gravels, tan brownish with some red mottling	QC04	D			
		End of hole 0.7m					
		End of Hole					
1							
2							
Drilled By: AS Drill Method: Hand Auger Drill Date: 04/07/2018							Hole Size: Sheet: 1 of 1



Sullivan Environmental Sciences Pty Ltd
PO Box 5248
Turramurra NSW 2074

Log of Borehole: SB13

Project No.: SES_442

Project: Pacific Plan Statewide - Updated Phase 2

X Coordinate: 0

Y Coordinate: 0

Location: Knight Steet Homebush

Elevation: 0

Total Depth: 0.9m

Project Manager: A Sullivan

SUBSURFACE PROFILE			SAMPLE			Well Completion Details	Additional Observations
Depth (m)	Symbol	Description	Number	Type	PID		
0		Ground Surface					
		FILL Silty topsoil, clay and gravel mixture, moist, firm, clay, some charcoal gravels					
		Whitish clay and gravel	0.1-0.2	D			
		0.3m - large chunk of slag					
		Natural Silty topsoil; dry brown soft					
		Dry					
		Becoming Clayey, moist, reddish hues, tree roots		D			
		End of hole 0.9m					
1		End of Hole					
2							
Drilled By: AS Drill Method: Hand Auger Drill Date: 04/07/2018							Hole Size: Sheet: 1 of 1



Sullivan Environmental Sciences Pty Ltd
PO Box 5248
Turramurra NSW 2074

Log of Borehole: SB14

Project No.: SES_442

Project: Pacific Plan Statewide - Updated Phase 2

X Coordinate: 0

Y Coordinate: 0

Location: Knight Steet Homebush

Elevation: 0

Total Depth: 0.8m

Project Manager: A Sullivan

SUBSURFACE PROFILE			SAMPLE			Well Completion Details	Additional Observations
Depth (m)	Symbol	Description	Number	Type	PID		
0		Ground Surface					
		FILL Sandy gravel and topsoil mixture, moist, loose, coarse		D			
		FILL Ash layer		D			
		NATURAL Silty Clay; medium plasticity, brown with reddish hues, moist, firm					
		End of hole 0.8m		D			
		End of Hole					
1							
2							
Drilled By: AS Drill Method: Hand Auger Drill Date: 04/07/2018							Hole Size: Sheet: 1 of 1



Sullivan Environmental Sciences Pty Ltd
PO Box 5248
Turramurra NSW 2074

Log of Borehole: SB15

Project No.: SES_442

Project: Pacific Plan Statewide - Updated Phase 2

X Coordinate: 0

Y Coordinate: 0

Location: Knight Steet Homebush

Elevation: 0

Total Depth: 0.8m

Project Manager: A Sullivan

SUBSURFACE PROFILE			SAMPLE			Well Completion Details	Additional Observations
Depth (m)	Symbol	Description	Number	Type	PID		
0		Ground Surface					
		FILL Gravelly Fill, sand and rubble					
		FILL Ashy fill layer	0.1-0.2	D			
		NATURAL Silty Clay, medium plasticity, brown with reddish hues, moist, firm					
		End of hole 0.8m					
		End of Hole					
1							
2							

Drilled By: AS

Drill Method: Hand Auger

Drill Date: 04/07/2018

Hole Size:

Sheet: 1 of 1



Sullivan Environmental Sciences Pty Ltd
PO Box 5248
Turramurra NSW 2074

Log of Borehole: SB16

Project No.: SES_442

Project: Pacific Plan Statewide - Updated Phase 2

X Coordinate: 0

Y Coordinate: 0

Location: Knight Steet Homebush

Elevation: 0

Total Depth: 0.8m

Project Manager: A Sullivan

SUBSURFACE PROFILE			SAMPLE			Well Completion Details	Additional Observations
Depth (m)	Symbol	Description	Number	Type	PID		
0		Ground Surface					
		FILL Thin surface gravels Silty Clay; medium plasticity, brown, moist, stiff, gravels	0.1-0.2	D			
		FILL Ash and slag layer	0.2-0.3	D			
			0.5-0.6	D			
		NATURAL Silty Clay; medium plasticity, brown with reddish hues, moist, firm		D			Borehole collapse impacting sample collection
		End of hole 0.8m					
		End of Hole					
1							
2							

Drilled By: AS

Drill Method: Hand Auger

Drill Date: 04/07/2018

Hole Size:

Sheet: 1 of 1



Sullivan Environmental Sciences Pty Ltd
PO Box 5248
Turramurra NSW 2074

Log of Borehole: SB17

Project No.: SES_442

Project: Pacific Plan Statewide - Updated Phase 2

X Coordinate: 0

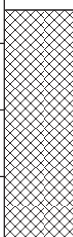
Y Coordinate: 0

Location: Knight Steet Homebush

Elevation: 0

Total Depth: 0.9m

Project Manager: A Sullivan

SUBSURFACE PROFILE			SAMPLE			Well Completion Details	Additional Observations
Depth (m)	Symbol	Description	Number	Type	PID		
0		Ground Surface					
		Turf Layer					
		FILL Silty clay, low plasticity, roots, firm, dark brown, moist		D			
		NATURAL Silty Clay, medium plasticity firm, tan brown with reddish hues, moist					
		End of hole 0.9m	QC05	D			
1		End of Hole					
2							

Drilled By: AS

Drill Method: Hand Auger

Drill Date: 04/07/2018

Hole Size:

Sheet: 1 of 1



Sullivan Environmental Sciences Pty Ltd
PO Box 5248
Turramurra NSW 2074

Log of Borehole: SB18

Project No.: SES_442

Project: Pacific Plan Statewide - Updated Phase 2

X Coordinate: 0

Y Coordinate: 0

Location: Knight Steet Homebush

Elevation: 0

Total Depth: 0.3m

Project Manager: A Sullivan

SUBSURFACE PROFILE			SAMPLE			Well Completion Details	Additional Observations
Depth (m)	Symbol	Description	Number	Type	PID		
0		Ground Surface					
		Turf Layer					
		FILL Silty Clay and gravels; moist, dark brown, medium plasticity clay, firm					
			0.2-0.3	D			
		Refusal on buried old concrete slab 0.3m					
		End of Hole					
1							
2							
Drilled By: AS Drill Method: Hand Auger Drill Date: 04/07/2018							Hole Size: Sheet: 1 of 1



Sullivan Environmental Sciences Pty Ltd
PO Box 5248
Turramurra NSW 2074

Log of Borehole: SB19

Project No.: SES_442

Project: Pacific Plan Statewide - Updated Phase 2

X Coordinate: 0

Y Coordinate: 0

Location: Knight Steet Homebush

Elevation: 0

Total Depth: 0.5m

Project Manager: A Sullivan

SUBSURFACE PROFILE			SAMPLE			Well Completion Details	Additional Observations
Depth (m)	Symbol	Description	Number	Type	PID		
0		Ground Surface					
		FILL Turf and topsoil and clay fill mixture					
		FILL Ash layer	0.1-0.2	D			
		NATURAL Silty Clay; medium plasticity, brown with reddish hues, moist, firm					
		End of hole 0.5m		D			
		End of Hole					
1							
2							
Drilled By: AS Drill Method: Hand Auger Drill Date: 04/07/2018							Hole Size: Sheet: 1 of 1

Appendix D Site Photographs



Photo 1: Loftus Crescent



Photo 2: Corner of Loftus Crescent and Subway Lane.



Photo 3: Motor mechanics off Subway Lane, and forecourt area with metal lids (underground tanks?)



Photo 4: Fibro shed in rear of 15 Loftus Crescent



Photo 5: Fibro sheeting on ground



Photo 6: Metal lids of potential underground tanks



Photo 7: Rear lane Parramatta Road portion, off Knight Street



Photo 8: Rear of Parramatta Road portion, retail shops



Photo 9: Rear lane of Parramatta Road portion



Photo 10: Loftus Crescent buildings demolished and cleared (facing west). Demolition/soil screening piles on right of photo.



Photo 11: Loftus Crescent buildings demolished and cleared (facing northwest).



Photo 12: Fibro cement sheeting in demolition waste pile. Analytical tests report this material to be asbestos free (see results Table 3 – sample FC01).



Photo 13: Former motor mechanics/panel beaters workshop.



Photo 14: Concrete pit within former motor mechanics/panel beaters workshop.



Photo 15: Concrete pit within former motor mechanics/panel beaters workshop.

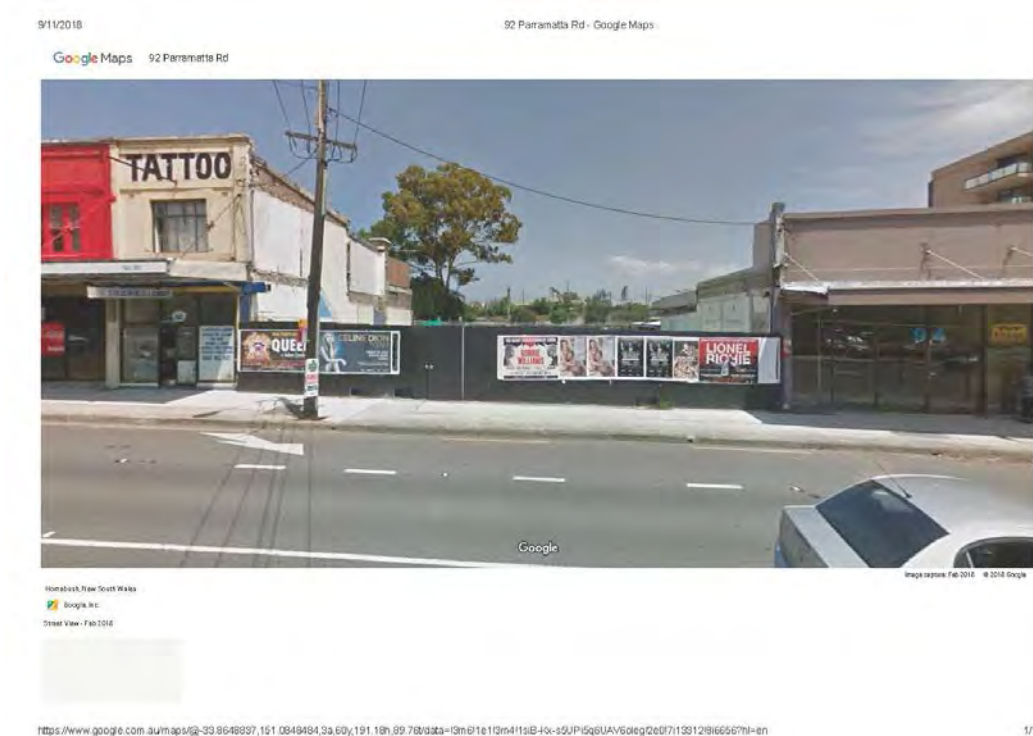


Photo 16: 88-92a Parramatta Road, buildings demolished.



Photo 17: No. 5 Knight Street demolished building with demolition waste pile.



Photo 18: No. 9 (demolished) and No. 11 (standing) Knight Street properties.



Photo 19: No. 9 (demolished) and No. 11 (standing) Knight Street.

Appendix E Historical Aerial Images

1930



1943



1951



1961



1972



1982



1994



2005



2015



2018



Appendix F Fieldsheets and Calibration Records

RENTALS

Equipment Report – SOIL AUGER KIT

This soil auger kit has been cleaned and checked:

Date: 21/03/2016 Checked by: MILENKO

Signed: _____

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum \$20 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Received	Returned	Item
/			1 Regular Auger Head
/			1 Clay Auger Head
/			1 Sand Auger Head
/			1 Tee Handle / Ratchet Handle
/			Extension rods Qty: <u>4</u>
/			1 Finger Ring for disconnecting extensions
X			<u>Canvas carry bag</u>
X			<u>Optional – straps for canvas carry bag</u>
/			<u>METAL Box</u>

Processors Signature/ Initials MS

Quote Reference	CS004388	Condition on return
Customer Ref		
Equipment ID	AM5705C	
Equipment serial no.		
Return Date	/ /	
Return Time		

"We do more than give you great equipment... We give you great solutions!"

Phone: (Free Call) 1300 735 295		Fax: (Free Call) 1800 675 123		Email: RentalsAU@Thermofisher.com	
Melbourne Branch 5 Canberran Drive, Scoresby 3179	Sydney Branch Level 1, 4 Talavera Road, North Ryde 2113	Adelaide Branch 27 Beulah Road, Norwood, South Australia 5067	Brisbane Branch Unit 2/5 Ross St Newstead 4006	Perth Branch 121 Berrigara Ave Mallaga WA 6090	

RENTALS

Equipment Report - MiniRAE 3000 PID

This Gas Meter has been performance checked and calibrated as follows:

Lamp	Compound	Concentration	Zero	Span	Traceability Lot #	Pass?
10.6 eV	Isobutylene	100 ppm	0.0 ppm	100.0 ppm	1808481 Cyl 2	☒

Alarm Limits

High	100 ppm
Low	50 ppm

Bump Test

Date	Target Gas	Reading	Pass?
21/03/2016	100 ppm	100.0 ppm	☒

- ☒ Battery Status 100%
☒ 10 minutes test complete
☒ Spare battery status (Min 5.5 volts)
☒ Electrical Safety Tag attached (AS/NZS 3760)

- ☒ Performance check (pump, lamp, sensor)
☒ Data cleared
☒ Filters checked

Tag No: 000446

Valid to: 12/05/2016

Date: 21/03/2016

Signed: [Signature]

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum \$30 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Returned	Item
☒	☐	MiniRAE 2000 PID / Operational Check / Battery Status 100%
☒	☐	Lamp 10.6 eV, Compound Set to: Isobutylene C/factor: 1
☒	☐	Protective yellow rubber boot
☒	☐	Inlet probe (attached to PID)
☒	☐	Spare water trap filter(s) Qty 1
☒	☐	Charger 240V to 12V1250mA
☒	☐	Cradle and Travel Charger
☒	☐	Instruction Manual behind foam on the lid of case "
☒	☐	Quick Guide Sheet behind foam on the lid of case "
☒	☐	Spare Alkaline Battery Compartment with batteries
☒	☐	Inline Moisture trap Filter Guide Laminated
☒	☐	Calibration regulator & tubing (optional)
☒	☐	Data cable and Software CD (optional)
☒	☐	Carry Case
☒	☐	Check to confirm electrical safety (tag must be valid)

Date: 21/03/2016

Signed: [Signature]

TFS Reference	CS004388	Return Date:	/ /
Customer Reference		Return Time:	
Equipment ID	PIDMIN3MF	Condition on return:	
Equipment Serial No.	592910909		

"We do more than give you great equipment... We give you great solutions!"

Phone: (Free Call) 1300 735 295		Fax: (Free Call) 1800 675 123		Email: RentalsAU@Thermofisher.com	
Melbourne Branch 5 Conbeach Drive, Scoresby 3179	Sydney Branch Level 1, 4 Talavera Road, North Ryde 2113	Adelaide Branch 27 Beulah Road, Norwood, South Australia 5067	Brisbane Branch Unit 2/5 Ross St, Newstead 4006	Perth Branch 121 Beringara Ave, Malaga WA 6090	

RENTALS

Equipment Report – Solinst Model 122 Interface Meter

This Meter has been performance checked / calibrated* as follows:

Cleaned/Tested

Pass? ☒ Yes

☐ No

☒ Probe

☒ Tape/Reel

☒ Performance Test & Battery Voltage Check (9.0 v) 8.0v minimum

Date: 04/04/2016

Checked by: Dave O'Neil

Signed: [Signature]

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum \$20 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Received	Returned	Item
☒	☒	☒	Operations check OK
☒	☒	☒	Plastic Box / Bag
☒	☒	☒	Spare 9V Battery Qty <u>1</u>
☒	☒	☒	Probe Cleaning Brush
☒	☒	☒	Decon
☒	☒	☒	Instruction leaflet
☒	☒	☒	Tape Guide
Processors Signature/ Initials			<u>[Signature]</u>

Quote Reference	<u>CS004488</u>	Condition on return
Customer Ref		
Equipment ID	<u>SOL122-2</u>	
Equipment serial no.	<u>224609</u>	
Return Date	<u>/ /</u>	
Return Time		

"We do more than give you great equipment... We give you great solutions!"

Phone: (Free Call) 1300 735 295		Fax: (Free Call) 1800 675 123		Email: RentalsAU@Thermofisher.com
Melbourne Branch 5 Canberran Drive Scoresby 3179	Sydney Branch Level 1, 4 Talavera Road North Ryde 2113	Adelaide Branch 27 Beulah Road, Norwood South Australia 5067	Brisbane Branch Unit 2/5 Ross St Newstead 4006	Perth Branch 121 Beringarra Ave Malaga WA 6090

RENTALS

Equipment Certification Report – TPS 90FLMV Water Quality Meter

This Water Quality Meter has been performance checked and calibrated as follows:

Sensor	Concentration	Span 1	Span 2	Traceability Lot #	Pass?
pH	pH 7.00 / pH 4.01	7.00 pH	4.00 pH	/	☒
Conductivity	12.88 mS/cm	0.00 mS/cm	12.88 mS/cm		☒
TDS	36 ppk	0 ppk	36.00 ppk		☒
Dissolved Oxygen	Sodium Sulphite / Air	0.00 ppm in Sodium Sulphite	8.71 ppm Saturation in Air		☒

Check only

Redox (ORP) *	Electrode operability test	240mV +/- 10%	241 mV		☒
---------------	----------------------------	---------------	--------	--	-------------------------------------

* This meter uses an Ag/AgCl ORP electrode. To convert readings to SHE (Standard Hydrogen Electrode), add 199mV to the mV reading.

- ☒ Battery Status 7.2 (min 7.2V)
☒ Electrical Safety Tag attached (AS/NZS 3760)

- ☒ Temperature 22.7 °C
☒ Electrodes Cleaned and checked

Tag No: 000405

Valid to: 15/04/2016

Date: 04/04/2016

Signed: [Signature]

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum \$30 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Returned	Item
☒	☐	90FLMV Unit. Ops check/Battery status: <u>8.0</u>
☒	☐	pH sensor with wetting cap, 5m
☒	☐	Conductivity/TDS/Temperature K=10 sensor, 5m
☒	☐	Dissolved oxygen YSI5739 sensor with wetting cap, 5m
☒	☐	Redox (ORP) sensor with wetting cap, 5m
☒	☐	Power supply 240V to 12V DC 200mA
☒	☐	Instruction Manual
☒	☐	Quick Guide
☒	☐	Syringe with storage solution for pH and ORP sensors
☒	☐	Carry Case
☒	☐	Check to confirm electrical safety (tag must be valid)

Date: 04/04/2016

Signed: [Signature]

TFS Reference	<u>C5004488</u>	Return Date:	/ /
Customer Reference		Return Time:	
Equipment ID	<u>90FLMV WAG</u>	Condition on return:	
Equipment Serial No.	<u>S8939</u>		

"We do more than give you great equipment... We give you great solutions!"

Phone: (Free Call) 1300 735 295		Fax: (Free Call) 1800 675 123		Email: RentalsAU@Thermofisher.com	
Melbourne Branch 5 Carlisle Drive Scoresby 3179	Sydney Branch Level 1, 4 Talavera Road, North Ryde 2113	Adelaide Branch 27 Beulah Road, Norwood, South Australia 5067	Brisbane Branch Unit 2/5 Ross St Newstead 4006	Perth Branch 121 Beringarra Ave Malaga WA 6090	

PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE No:

1341

Project No SES-442

Project Name

Phase 2 Remedial

Date 5/4/16

Sampled by: A.S.

Development

Development Method

Time Started

Time Stopped

Comments

SWL (start)

SWL (end)

Volume Removed

Discharge Rate

Bore Depth (start)

Bore Depth (end)

NAPL Present

(If yes thickness)

Purging

Bailer

Purge Method

Time Started

Time Stopped

Comments

Purge Depth

SWL (start)

SWL (end)

Bore Volume

Volume Removed

Bore Depth (start)

Bore Depth (end)

NAPL Present

(If yes thickness)

5.8 / water

Dry after 7 L - clear water - w slight cloudy.

Sampling

Sampling Method

Time Started

Time Stopped

Comments

Sampling Depth

SWL (start)

SWL (end)

OVA Monitoring

Time	Ambient	Bore Head	Discharge

Field Analyses

Time	Vol Removed (L)	EC (uS/cm)	pH	T (C)	Redox (mV)	Dissolved Oxygen (%)	Comments (Color, turbidity)
		16.4 mS	5.1	23.9	137	4.3	

PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE No: 3H4
(9A)

Project No _____ Project Name _____ Date _____ Sampled by: _____

Development

Development Method _____
Time Started _____ SWL (start) _____
Time Stopped _____ SWL (end) _____
Comments _____
Volume Removed _____
Discharge Rate _____
Bore Depth (start) _____
Bore Depth (end) _____
NAPL Present _____
(If yes thickness) _____

Purging

Purge Method Bar/le
Time Started _____ Purge Depth _____
Time Stopped _____ SWL (start) 2.69 m bte
Comments dry after ~ 15 L. SWL (end) _____
Bore Volume _____
Volume Removed _____
Bore Depth (start) 6.86 m bte
Bore Depth (end) _____
NAPL Present _____
(If yes thickness) _____

Sampling

Sampling Method _____
Time Started _____ Sampling Depth _____
Time Stopped _____ SWL (start) _____
Comments _____ SWL (end) _____

OVA Monitoring

Time	Ambient	Bore Head	Discharge

Field Analyses

Time	Vol Removed (L)	EC (uS/cm)	pH	T (C)	Redox (mV)	Dissolved Oxygen (%)	Comments (Color, turbidity)
		8.21 mS	6.3	21.4	115	5.1	Dark grey turbid

PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE No: 1345

Project No _____ Project Name _____ Date _____ Sampled by: _____

Development

Development Method
Time Started _____
Time Stopped _____
Comments _____

SWL (start) _____
SWL (end) _____
Volume Removed _____
Discharge Rate _____

Bore Depth (start) _____
Bore Depth (end) _____
NAPL Present _____
(If yes thickness) _____

Purging

Purge Method Bailer
Time Started _____
Time Stopped _____
Comments _____

Purge Depth
SWL (start) 2.17 m below
SWL (end) _____

Bore Volume _____
Volume Removed _____

Bore Depth (start) 8.72 m below
Bore Depth (end) _____
NAPL Present _____
(If yes thickness) _____

Sampling

Sampling Method _____
Time Started _____
Time Stopped _____
Comments _____

Sampling Depth
SWL (start) _____
SWL (end) _____

OVA Monitoring

Time	Ambient	Bore Head	Discharge

Field Analyses

Time	Vol Removed (L)	EC (uS/cm)	pH	T (C)	Redox (mV)	Dissolved Oxygen (%)	Comments (Color, turbidity)
		<u>15.3 mS</u>	<u>5.6</u>	<u>23.7</u>	<u>99</u>	<u>2.4</u>	<u>Very murky grey/turbid anoxic/salty smell.</u>

PURGING AND GROUNDWATER SAMPLING DATA SHEET

BORE No: BH6

Project No _____ Project Name _____

Date 5/4/16 Sampled by: _____

Development

Development Method
Time Started _____
Time Stopped _____
Comments _____

Volume Removed _____
Discharge Rate _____

Bore Depth (start) _____
Bore Depth (end) _____
NAPL Present _____
(If yes thickness) _____

Purging

Purge Method Bailer
Time Started _____
Time Stopped _____
Comments _____

Purge Depth
SWL (start) _____
SWL (end) _____

1.74 m

Bore Volume _____
Volume Removed _____

Bore Depth (start) _____
Bore Depth (end) _____
NAPL Present _____
(If yes thickness) _____

sediments at base of bore
Bailed dry after ~ 10L. Very dark grey murky turbid.

Sampling

Sampling Method
Time Started _____
Time Stopped _____
Comments _____

Sampling Depth
SWL (start) _____
SWL (end) _____

OVA Monitoring

Time	Ambient	Bore Head	Discharge

Field Analyses

Time	Vol Removed (L)	EC (uS/cm)	pH	T (C)	Redox (mV)	Dissolved Oxygen (%)	Comments (Color, turbidity)
	<u>No</u>	<u>readings - too</u>	<u>low</u>	<u>silty turbid.</u>			

Appendix G 95% UCL Calculation Sheet

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Uncensored Full Data Sets											
2												
3	User Selected Options											
4	Date/Time of Computation			12/09/2018 2:36:51 PM								
5	From File			WorkSheet.xls								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	Number of Bootstrap Operations			2000								
9												
10												
11	C0											
12												
13	General Statistics											
14	Total Number of Observations				13		Number of Distinct Observations				5	
15							Number of Missing Observations				0	
16	Minimum				0.6		Mean				1.862	
17	Maximum				7		Median				0.6	
18	SD				2.257		Std. Error of Mean				0.626	
19	Coefficient of Variation				1.212		Skewness				1.566	
20												
21	Normal GOF Test											
22	Shapiro Wilk Test Statistic				0.626		Shapiro Wilk GOF Test					
23	5% Shapiro Wilk Critical Value				0.866		Data Not Normal at 5% Significance Level					
24	Lilliefors Test Statistic				0.404		Lilliefors GOF Test					
25	5% Lilliefors Critical Value				0.246		Data Not Normal at 5% Significance Level					
26	Data Not Normal at 5% Significance Level											
27												
28	Assuming Normal Distribution											
29	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
30	95% Student's-t UCL				2.977		95% Adjusted-CLT UCL (Chen-1995)				3.182	
31							95% Modified-t UCL (Johnson-1978)				3.023	
32												
33	Gamma GOF Test											
34	A-D Test Statistic				2.427		Anderson-Darling Gamma GOF Test					
35	5% A-D Critical Value				0.756		Data Not Gamma Distributed at 5% Significance Level					
36	K-S Test Statistic				0.431		Kolmogrov-Smirnoff Gamma GOF Test					
37	5% K-S Critical Value				0.243		Data Not Gamma Distributed at 5% Significance Level					
38	Data Not Gamma Distributed at 5% Significance Level											
39												
40	Gamma Statistics											
41	k hat (MLE)				1.07		k star (bias corrected MLE)				0.874	
42	Theta hat (MLE)				1.74		Theta star (bias corrected MLE)				2.13	
43	nu hat (MLE)				27.81		nu star (bias corrected)				22.73	
44	MLE Mean (bias corrected)				1.862		MLE Sd (bias corrected)				1.991	
45							Approximate Chi Square Value (0.05)				12.88	
46	Adjusted Level of Significance				0.0301		Adjusted Chi Square Value				11.84	
47												
48	Assuming Gamma Distribution											
49	95% Approximate Gamma UCL (use when n>=50))				3.284		95% Adjusted Gamma UCL (use when n<50)				3.573	
50												
51	Lognormal GOF Test											
52	Shapiro Wilk Test Statistic				0.639		Shapiro Wilk Lognormal GOF Test					
53	5% Shapiro Wilk Critical Value				0.866		Data Not Lognormal at 5% Significance Level					
54	Lilliefors Test Statistic				0.421		Lilliefors Lognormal GOF Test					

	A	B	C	D	E	F	G	H	I	J	K	L	
55	5% Lilliefors Critical Value					0.246	Data Not Lognormal at 5% Significance Level						
56	Data Not Lognormal at 5% Significance Level												
57													
58	Lognormal Statistics												
59	Minimum of Logged Data					-0.511	Mean of logged Data					0.0859	
60	Maximum of Logged Data					1.946	SD of logged Data					0.982	
61													
62	Assuming Lognormal Distribution												
63	95% H-UCL					3.919	90% Chebyshev (MVUE) UCL					3.153	
64	95% Chebyshev (MVUE) UCL					3.821	97.5% Chebyshev (MVUE) UCL					4.748	
65	99% Chebyshev (MVUE) UCL					6.57							
66													
67	Nonparametric Distribution Free UCL Statistics												
68	Data do not follow a Discernible Distribution (0.05)												
69													
70	Nonparametric Distribution Free UCLs												
71	95% CLT UCL					2.891	95% Jackknife UCL					2.977	
72	95% Standard Bootstrap UCL					2.854	95% Bootstrap-t UCL					3.445	
73	95% Hall's Bootstrap UCL					2.635	95% Percentile Bootstrap UCL					2.931	
74	95% BCA Bootstrap UCL					3.115							
75	90% Chebyshev(Mean, Sd) UCL					3.74	95% Chebyshev(Mean, Sd) UCL					4.59	
76	97.5% Chebyshev(Mean, Sd) UCL					5.771	99% Chebyshev(Mean, Sd) UCL					8.09	
77													
78	Suggested UCL to Use												
79	95% Chebyshev (Mean, Sd) UCL					4.59							
80													
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.												
82	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)												
83	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.												
84	For additional insight the user may want to consult a statistician.												
85													

Appendix H Laboratory Analytical Reports

CERTIFICATE OF ANALYSIS

Work Order : **ES1607018**
Client : **SULLIVAN ENVIRONMENTAL SCIENCES**
Contact : ADAM SULLIVAN
Address : PO Box 5248
 TURRAMURRA NSW 2074
Telephone : ----
Project : SES_442
Order number : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : ----
No. of samples received : 27
No. of samples analysed : 21

Page : 1 of 29
Laboratory : Environmental Division Sydney
Contact :
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 31-Mar-2016 14:00
Date Analysis Commenced : 01-Apr-2016
Issue Date : 07-Apr-2016 16:38

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 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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos, Mayfield West, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
RICHARD TEA	Lab technician	Sydney Inorganics, Smithfield, 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.

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.

- 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), Dibenzo(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), Dibenzo(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	BH1_0.2-0.3	BH1_1.5-1.7	BH2_0.2-0.4	BH2_3.8-4.0	BH3_0.2-0.4
Client sampling date / time					[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]
Compound	CAS Number	LOR	Unit		ES1607018-001	ES1607018-002	ES1607018-004	ES1607018-006	ES1607018-007
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		20.2	17.6	20.7	20.5	26.0
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		49.5	----	37.3	----	42.7
APPROVED IDENTIFIER:	----	-	--		C.OWLER	----	C.OWLER	----	C.OWLER
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		3	16	12	19	18
Copper	7440-50-8	5	mg/kg		21	6	33	6	21
Lead	7439-92-1	5	mg/kg		60	31	30	16	24
Nickel	7440-02-0	2	mg/kg		<2	<2	<2	<2	4
Zinc	7440-66-6	5	mg/kg		<5	17	9	8	7
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EN33: TCLP Leach									
Initial pH	----	0.1	pH Unit		----	----	----	6.0	----
After HCl pH	----	0.1	pH Unit		----	----	----	1.6	----
Extraction Fluid Number	----	1	-		----	----	----	1	----
Final pH	----	0.1	pH Unit		----	----	----	4.8	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	0.5	mg/kg		----	<0.5	----	<0.5	----
Isopropylbenzene	98-82-8	0.5	mg/kg		----	<0.5	----	<0.5	----
n-Propylbenzene	103-65-1	0.5	mg/kg		----	<0.5	----	<0.5	----
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg		----	<0.5	----	<0.5	----
sec-Butylbenzene	135-98-8	0.5	mg/kg		----	<0.5	----	<0.5	----
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg		----	<0.5	----	<0.5	----
tert-Butylbenzene	98-06-6	0.5	mg/kg		----	<0.5	----	<0.5	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg		----	<0.5	----	<0.5	----
n-Butylbenzene	104-51-8	0.5	mg/kg		----	<0.5	----	<0.5	----
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	5	mg/kg		----	<5	----	<5	----
2-Butanone (MEK)	78-93-3	5	mg/kg		----	<5	----	<5	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH1_0.2-0.3	BH1_1.5-1.7	BH2_0.2-0.4	BH2_3.8-4.0	BH3_0.2-0.4
Client sampling date / time					[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]
Compound	CAS Number	LOR	Unit		ES1607018-001	ES1607018-002	ES1607018-004	ES1607018-006	ES1607018-007
					Result	Result	Result	Result	Result
EP074B: Oxygenated Compounds - Continued									
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg		----	<5	----	<5	----
2-Hexanone (MBK)	591-78-6	5	mg/kg		----	<5	----	<5	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	0.5	mg/kg		----	<0.5	----	<0.5	----
EP074D: Fumigants									
2,2-Dichloropropane	594-20-7	0.5	mg/kg		----	<0.5	----	<0.5	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg		----	<0.5	----	<0.5	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg		----	<0.5	----	<0.5	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg		----	<0.5	----	<0.5	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg		----	<0.5	----	<0.5	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	5	mg/kg		----	<5	----	<5	----
Chloromethane	74-87-3	5	mg/kg		----	<5	----	<5	----
Vinyl chloride	75-01-4	5	mg/kg		----	<5	----	<5	----
Bromomethane	74-83-9	5	mg/kg		----	<5	----	<5	----
Chloroethane	75-00-3	5	mg/kg		----	<5	----	<5	----
Trichlorofluoromethane	75-69-4	5	mg/kg		----	<5	----	<5	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg		----	<0.5	----	<0.5	----
Iodomethane	74-88-4	0.5	mg/kg		----	<0.5	----	<0.5	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg		----	<0.5	----	<0.5	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg		----	<0.5	----	<0.5	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg		----	<0.5	----	<0.5	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg		----	<0.5	----	<0.5	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg		----	<0.5	----	<0.5	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg		----	<0.5	----	<0.5	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg		----	<0.5	----	<0.5	----
Trichloroethene	79-01-6	0.5	mg/kg		----	<0.5	----	<0.5	----
Dibromomethane	74-95-3	0.5	mg/kg		----	<0.5	----	<0.5	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg		----	<0.5	----	<0.5	----
1,3-Dichloropropane	142-28-9	0.5	mg/kg		----	<0.5	----	<0.5	----
Tetrachloroethene	127-18-4	0.5	mg/kg		----	<0.5	----	<0.5	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg		----	<0.5	----	<0.5	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg		----	<0.5	----	<0.5	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg		----	<0.5	----	<0.5	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH1_0.2-0.3	BH1_1.5-1.7	BH2_0.2-0.4	BH2_3.8-4.0	BH3_0.2-0.4
Client sampling date / time					[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]
Compound	CAS Number	LOR	Unit		ES1607018-001	ES1607018-002	ES1607018-004	ES1607018-006	ES1607018-007
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg		----	<0.5	----	<0.5	----
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg		----	<0.5	----	<0.5	----
Pentachloroethane	76-01-7	0.5	mg/kg		----	<0.5	----	<0.5	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg		----	<0.5	----	<0.5	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg		----	<0.5	----	<0.5	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	0.5	mg/kg		----	<0.5	----	<0.5	----
Bromobenzene	108-86-1	0.5	mg/kg		----	<0.5	----	<0.5	----
2-Chlorotoluene	95-49-8	0.5	mg/kg		----	<0.5	----	<0.5	----
4-Chlorotoluene	106-43-4	0.5	mg/kg		----	<0.5	----	<0.5	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg		----	<0.5	----	<0.5	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg		----	<0.5	----	<0.5	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg		----	<0.5	----	<0.5	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg		----	<0.5	----	<0.5	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg		----	<0.5	----	<0.5	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	0.5	mg/kg		----	<0.5	----	<0.5	----
Bromodichloromethane	75-27-4	0.5	mg/kg		----	<0.5	----	<0.5	----
Dibromochloromethane	124-48-1	0.5	mg/kg		----	<0.5	----	<0.5	----
Bromoform	75-25-2	0.5	mg/kg		----	<0.5	----	<0.5	----
EP074H: Naphthalene									
Naphthalene	91-20-3	1	mg/kg		----	<1	----	<1	----
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
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



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH1_0.2-0.3	BH1_1.5-1.7	BH2_0.2-0.4	BH2_3.8-4.0	BH3_0.2-0.4
Client sampling date / time					[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]
Compound	CAS Number	LOR	Unit		ES1607018-001	ES1607018-002	ES1607018-004	ES1607018-006	ES1607018-007
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
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									
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



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH1_0.2-0.3	BH1_1.5-1.7	BH2_0.2-0.4	BH2_3.8-4.0	BH3_0.2-0.4
Client sampling date / time					[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]
Compound	CAS Number	LOR	Unit		ES1607018-001	ES1607018-002	ES1607018-004	ES1607018-006	ES1607018-007
					Result	Result	Result	Result	Result
EP074S: VOC Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.5	%		----	92.0	----	91.0	----
Toluene-D8	2037-26-5	0.5	%		----	95.5	----	93.7	----
4-Bromofluorobenzene	460-00-4	0.5	%		----	95.4	----	96.7	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		81.9	79.0	78.5	82.4	77.0
2-Chlorophenol-D4	93951-73-6	0.5	%		93.0	89.2	89.5	93.1	74.8
2,4,6-Tribromophenol	118-79-6	0.5	%		56.8	46.5	50.5	51.1	45.7
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		115	111	110	114	110
Anthracene-d10	1719-06-8	0.5	%		111	108	108	111	102
4-Terphenyl-d14	1718-51-0	0.5	%		127	126	121	125	127
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		108	115	113	114	109
Toluene-D8	2037-26-5	0.2	%		96.6	100	96.1	97.6	90.0
4-Bromofluorobenzene	460-00-4	0.2	%		101	104	102	107	95.6



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH3_1.8-2.0	BH4_0.3	BH5_0.5-0.6	BH5_2.5-2.8	QC02
Client sampling date / time					[22-Mar-2016]	[22-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]
Compound	CAS Number	LOR	Unit		ES1607018-008	ES1607018-009	ES1607018-011	ES1607018-012	ES1607018-013
				Result	Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		16.1	25.0	19.4	15.5	16.4
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	----	30.1	55.5	----	----	----
APPROVED IDENTIFIER:	----	-	--	----	C.OWLER	G.MORGAN	----	----	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	<5	<5	5	<5	<5	5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	5	22	12	7	10	10
Copper	7440-50-8	5	mg/kg	14	18	42	9	15	15
Lead	7439-92-1	5	mg/kg	20	22	68	8	13	13
Nickel	7440-02-0	2	mg/kg	<2	<2	11	<2	<2	<2
Zinc	7440-66-6	5	mg/kg	<5	5	67	<5	6	6
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
EN33: TCLP Leach									
Initial pH	----	0.1	pH Unit	----	----	----	----	----	----
After HCl pH	----	0.1	pH Unit	----	----	----	----	----	----
Extraction Fluid Number	----	1	-	----	----	----	----	----	----
Final pH	----	0.1	pH Unit	----	----	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	0.5	mg/kg	----	----	----	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	----	----	----	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	----	----	----	----	----	----
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	----	----	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	----	----	----	----	----
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	----	----	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	----	----	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	----	----	----	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	----	----	----	----	----	----
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	5	mg/kg	----	----	----	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	----	----	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH3_1.8-2.0	BH4_0.3	BH5_0.5-0.6	BH5_2.5-2.8	QC02
Client sampling date / time					[22-Mar-2016]	[22-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]
Compound	CAS Number	LOR	Unit		ES1607018-008	ES1607018-009	ES1607018-011	ES1607018-012	ES1607018-013
					Result	Result	Result	Result	Result
EP074B: Oxygenated Compounds - Continued									
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg		----	----	----	----	----
2-Hexanone (MBK)	591-78-6	5	mg/kg		----	----	----	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	0.5	mg/kg		----	----	----	----	----
EP074D: Fumigants									
2,2-Dichloropropane	594-20-7	0.5	mg/kg		----	----	----	----	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg		----	----	----	----	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg		----	----	----	----	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg		----	----	----	----	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg		----	----	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	5	mg/kg		----	----	----	----	----
Chloromethane	74-87-3	5	mg/kg		----	----	----	----	----
Vinyl chloride	75-01-4	5	mg/kg		----	----	----	----	----
Bromomethane	74-83-9	5	mg/kg		----	----	----	----	----
Chloroethane	75-00-3	5	mg/kg		----	----	----	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg		----	----	----	----	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg		----	----	----	----	----
Iodomethane	74-88-4	0.5	mg/kg		----	----	----	----	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg		----	----	----	----	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg		----	----	----	----	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg		----	----	----	----	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg		----	----	----	----	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg		----	----	----	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg		----	----	----	----	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg		----	----	----	----	----
Trichloroethene	79-01-6	0.5	mg/kg		----	----	----	----	----
Dibromomethane	74-95-3	0.5	mg/kg		----	----	----	----	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg		----	----	----	----	----
1,3-Dichloropropane	142-28-9	0.5	mg/kg		----	----	----	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg		----	----	----	----	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg		----	----	----	----	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg		----	----	----	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg		----	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH3_1.8-2.0	BH4_0.3	BH5_0.5-0.6	BH5_2.5-2.8	QC02
Client sampling date / time					[22-Mar-2016]	[22-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]
Compound	CAS Number	LOR	Unit		ES1607018-008	ES1607018-009	ES1607018-011	ES1607018-012	ES1607018-013
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg		----	----	----	----	----
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg		----	----	----	----	----
Pentachloroethane	76-01-7	0.5	mg/kg		----	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg		----	----	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg		----	----	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	0.5	mg/kg		----	----	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg		----	----	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg		----	----	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg		----	----	----	----	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg		----	----	----	----	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg		----	----	----	----	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg		----	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg		----	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg		----	----	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	0.5	mg/kg		----	----	----	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg		----	----	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg		----	----	----	----	----
Bromoform	75-25-2	0.5	mg/kg		----	----	----	----	----
EP074H: Naphthalene									
Naphthalene	91-20-3	1	mg/kg		----	----	----	----	----
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
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	3.7	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	0.8	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	6.1	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	6.6	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	3.1	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	3.2	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	3.4	<0.5	<0.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH3_1.8-2.0	BH4_0.3	BH5_0.5-0.6	BH5_2.5-2.8	QC02
Client sampling date / time					[22-Mar-2016]	[22-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]
Compound	CAS Number	LOR	Unit		ES1607018-008	ES1607018-009	ES1607018-011	ES1607018-012	ES1607018-013
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	1.4	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	3.2	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	2.3	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	0.6	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	3.8	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	38.2	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	4.9	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		0.6	0.6	4.9	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	1.2	4.9	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	170	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	160	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	330	<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	300	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	300	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
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



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH3_1.8-2.0	BH4_0.3	BH5_0.5-0.6	BH5_2.5-2.8	QC02
Client sampling date / time					[22-Mar-2016]	[22-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]
Compound	CAS Number	LOR	Unit		ES1607018-008	ES1607018-009	ES1607018-011	ES1607018-012	ES1607018-013
					Result	Result	Result	Result	Result
EP074S: VOC Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.5	%		----	----	----	----	----
Toluene-D8	2037-26-5	0.5	%		----	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.5	%		----	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		82.2	82.0	72.3	75.7	81.2
2-Chlorophenol-D4	93951-73-6	0.5	%		93.6	92.3	78.2	81.4	90.0
2,4,6-Tribromophenol	118-79-6	0.5	%		46.0	48.7	62.1	50.3	46.7
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		116	114	107	103	112
Anthracene-d10	1719-06-8	0.5	%		112	112	105	99.4	108
4-Terphenyl-d14	1718-51-0	0.5	%		124	124	112	115	124
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		119	110	114	116	118
Toluene-D8	2037-26-5	0.2	%		95.7	87.2	94.7	96.3	100
4-Bromofluorobenzene	460-00-4	0.2	%		104	91.3	101	101	107



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH6_0.4	BH6_3.0	BH7_0.2	BH8_0.1	BH8_1.1
Client sampling date / time					[28-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]
Compound	CAS Number	LOR	Unit		ES1607018-014	ES1607018-015	ES1607018-016	ES1607018-018	ES1607018-019
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		25.6	10.2	21.4	13.1	24.7
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		40.8	----	33.1	35.0	----
APPROVED IDENTIFIER:	----	-	--		G.MORGAN	----	G.MORGAN	G.MORGAN	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		6	8	11	8	5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		29	7	27	15	25
Copper	7440-50-8	5	mg/kg		23	39	70	68	12
Lead	7439-92-1	5	mg/kg		29	13	428	299	20
Nickel	7440-02-0	2	mg/kg		4	<2	12	7	5
Zinc	7440-66-6	5	mg/kg		48	<5	425	277	26
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	0.4	0.2	<0.1
EN33: TCLP Leach									
Initial pH	----	0.1	pH Unit		5.2	----	----	----	----
After HCl pH	----	0.1	pH Unit		1.6	----	----	----	----
Extraction Fluid Number	----	1	-		1	----	----	----	----
Final pH	----	0.1	pH Unit		4.8	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	0.5	mg/kg		----	<0.5	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg		----	<0.5	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg		----	<0.5	----	----	----
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg		----	<0.5	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg		----	<0.5	----	----	----
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg		----	<0.5	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg		----	<0.5	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg		----	<0.5	----	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg		----	<0.5	----	----	----
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	5	mg/kg		----	<5	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg		----	<5	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH6_0.4	BH6_3.0	BH7_0.2	BH8_0.1	BH8_1.1
Client sampling date / time					[28-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]
Compound	CAS Number	LOR	Unit		ES1607018-014	ES1607018-015	ES1607018-016	ES1607018-018	ES1607018-019
					Result	Result	Result	Result	Result
EP074B: Oxygenated Compounds - Continued									
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg		----	<5	----	----	----
2-Hexanone (MBK)	591-78-6	5	mg/kg		----	<5	----	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	0.5	mg/kg		----	<0.5	----	----	----
EP074D: Fumigants									
2,2-Dichloropropane	594-20-7	0.5	mg/kg		----	<0.5	----	----	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg		----	<0.5	----	----	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg		----	<0.5	----	----	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg		----	<0.5	----	----	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg		----	<0.5	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	5	mg/kg		----	<5	----	----	----
Chloromethane	74-87-3	5	mg/kg		----	<5	----	----	----
Vinyl chloride	75-01-4	5	mg/kg		----	<5	----	----	----
Bromomethane	74-83-9	5	mg/kg		----	<5	----	----	----
Chloroethane	75-00-3	5	mg/kg		----	<5	----	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg		----	<5	----	----	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg		----	<0.5	----	----	----
Iodomethane	74-88-4	0.5	mg/kg		----	<0.5	----	----	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg		----	<0.5	----	----	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg		----	<0.5	----	----	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg		----	<0.5	----	----	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg		----	<0.5	----	----	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg		----	<0.5	----	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg		----	<0.5	----	----	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg		----	<0.5	----	----	----
Trichloroethene	79-01-6	0.5	mg/kg		----	<0.5	----	----	----
Dibromomethane	74-95-3	0.5	mg/kg		----	<0.5	----	----	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg		----	<0.5	----	----	----
1,3-Dichloropropane	142-28-9	0.5	mg/kg		----	<0.5	----	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg		----	<0.5	----	----	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg		----	<0.5	----	----	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg		----	<0.5	----	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg		----	<0.5	----	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH6_0.4	BH6_3.0	BH7_0.2	BH8_0.1	BH8_1.1
Client sampling date / time				[28-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]
Compound	CAS Number	LOR	Unit	ES1607018-014	ES1607018-015	ES1607018-016	ES1607018-018	ES1607018-019
				Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued								
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	<0.5	----	----	----
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	----	<0.5	----	----	----
Pentachloroethane	76-01-7	0.5	mg/kg	----	<0.5	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	<0.5	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	<0.5	----	----	----
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	0.5	mg/kg	----	<0.5	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg	----	<0.5	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	----	<0.5	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	----	<0.5	----	----	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	----	<0.5	----	----	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	----	<0.5	----	----	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	----	<0.5	----	----	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	----	<0.5	----	----	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	----	<0.5	----	----	----
EP074G: Trihalomethanes								
Chloroform	67-66-3	0.5	mg/kg	----	<0.5	----	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg	----	<0.5	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg	----	<0.5	----	----	----
Bromoform	75-25-2	0.5	mg/kg	----	<0.5	----	----	----
EP074H: Naphthalene								
Naphthalene	91-20-3	1	mg/kg	----	<1	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	4.6	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	7.2	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	1.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	9.3	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	60.6	0.7	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	17.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	69.2	1.3	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	64.4	1.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	37.1	0.8	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	32.7	0.8	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	32.6	1.0	<0.5



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH6_0.4	BH6_3.0	BH7_0.2	BH8_0.1	BH8_1.1
Client sampling date / time				[28-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]
Compound	CAS Number	LOR	Unit	ES1607018-014	ES1607018-015	ES1607018-016	ES1607018-018	ES1607018-019
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	11.8	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	35.1	0.9	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	18.0	0.6	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	4.8	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	23.0	1.0	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	429	8.6	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	50.4	1.2	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	50.4	1.4	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	50.4	1.7	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	1260	250	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	950	380	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	2210	630	<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	2010	540	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	560	190	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	2570	730	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080: BTEXN								
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



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH6_0.4	BH6_3.0	BH7_0.2	BH8_0.1	BH8_1.1
Client sampling date / time					[28-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]	[28-Mar-2016]
Compound	CAS Number	LOR	Unit		ES1607018-014	ES1607018-015	ES1607018-016	ES1607018-018	ES1607018-019
					Result	Result	Result	Result	Result
EP074S: VOC Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.5	%		----	106	----	----	----
Toluene-D8	2037-26-5	0.5	%		----	99.2	----	----	----
4-Bromofluorobenzene	460-00-4	0.5	%		----	102	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		81.3	83.1	80.3	81.8	86.4
2-Chlorophenol-D4	93951-73-6	0.5	%		91.4	93.6	88.9	89.4	92.8
2,4,6-Tribromophenol	118-79-6	0.5	%		51.0	50.7	84.1	79.6	70.4
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		113	116	111	108	112
Anthracene-d10	1719-06-8	0.5	%		112	114	101	107	115
4-Terphenyl-d14	1718-51-0	0.5	%		120	127	115	114	120
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		118	104	121	119	113
Toluene-D8	2037-26-5	0.2	%		95.8	105	99.7	93.1	98.4
4-Bromofluorobenzene	460-00-4	0.2	%		101	99.6	101	99.4	104



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH9_0.2	SB10_0.3-0.4	SB11_0.3-0.5	SB11_0.9-1.1	QC01
Client sampling date / time					[28-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]
Compound	CAS Number	LOR	Unit		ES1607018-020	ES1607018-022	ES1607018-024	ES1607018-025	ES1607018-026
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		16.0	23.3	20.8	12.4	14.4
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		59.6	22.9	44.5	----	----
APPROVED IDENTIFIER:	----	-	--		C.OWLER	C.OWLER	C.OWLER	----	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		6	5	5	6	6
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		8	22	24	28	28
Copper	7440-50-8	5	mg/kg		68	18	26	16	15
Lead	7439-92-1	5	mg/kg		667	22	58	48	37
Nickel	7440-02-0	2	mg/kg		2	3	4	4	4
Zinc	7440-66-6	5	mg/kg		133	8	29	25	21
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EN33: TCLP Leach									
Initial pH	----	0.1	pH Unit		----	----	----	----	----
After HCl pH	----	0.1	pH Unit		----	----	----	----	----
Extraction Fluid Number	----	1	-		----	----	----	----	----
Final pH	----	0.1	pH Unit		----	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	0.5	mg/kg		----	----	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg		----	----	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg		----	----	----	----	----
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg		----	----	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg		----	----	----	----	----
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg		----	----	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg		----	----	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg		----	----	----	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg		----	----	----	----	----
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	5	mg/kg		----	----	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg		----	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH9_0.2	SB10_0.3-0.4	SB11_0.3-0.5	SB11_0.9-1.1	QC01
Client sampling date / time					[28-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]
Compound	CAS Number	LOR	Unit		ES1607018-020	ES1607018-022	ES1607018-024	ES1607018-025	ES1607018-026
					Result	Result	Result	Result	Result
EP074B: Oxygenated Compounds - Continued									
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg		----	----	----	----	----
2-Hexanone (MBK)	591-78-6	5	mg/kg		----	----	----	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	0.5	mg/kg		----	----	----	----	----
EP074D: Fumigants									
2,2-Dichloropropane	594-20-7	0.5	mg/kg		----	----	----	----	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg		----	----	----	----	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg		----	----	----	----	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg		----	----	----	----	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg		----	----	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	5	mg/kg		----	----	----	----	----
Chloromethane	74-87-3	5	mg/kg		----	----	----	----	----
Vinyl chloride	75-01-4	5	mg/kg		----	----	----	----	----
Bromomethane	74-83-9	5	mg/kg		----	----	----	----	----
Chloroethane	75-00-3	5	mg/kg		----	----	----	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg		----	----	----	----	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg		----	----	----	----	----
Iodomethane	74-88-4	0.5	mg/kg		----	----	----	----	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg		----	----	----	----	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg		----	----	----	----	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg		----	----	----	----	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg		----	----	----	----	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg		----	----	----	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg		----	----	----	----	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg		----	----	----	----	----
Trichloroethene	79-01-6	0.5	mg/kg		----	----	----	----	----
Dibromomethane	74-95-3	0.5	mg/kg		----	----	----	----	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg		----	----	----	----	----
1,3-Dichloropropane	142-28-9	0.5	mg/kg		----	----	----	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg		----	----	----	----	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg		----	----	----	----	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg		----	----	----	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg		----	----	----	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH9_0.2	SB10_0.3-0.4	SB11_0.3-0.5	SB11_0.9-1.1	QC01
Client sampling date / time				[28-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]
Compound	CAS Number	LOR	Unit	ES1607018-020	ES1607018-022	ES1607018-024	ES1607018-025	ES1607018-026
				Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued								
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	----	----	----	----
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	----	----	----	----	----
Pentachloroethane	76-01-7	0.5	mg/kg	----	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	----	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	----	----	----	----
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	0.5	mg/kg	----	----	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg	----	----	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	----	----	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	----	----	----	----	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	----	----	----	----	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	----	----	----	----	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	----	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	----	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	----	----	----	----	----
EP074G: Trihalomethanes								
Chloroform	67-66-3	0.5	mg/kg	----	----	----	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg	----	----	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg	----	----	----	----	----
Bromoform	75-25-2	0.5	mg/kg	----	----	----	----	----
EP074H: Naphthalene								
Naphthalene	91-20-3	1	mg/kg	----	----	----	----	----
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
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	2.8	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.6	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	1.1	<0.5	6.8	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	1.2	<0.5	7.6	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	0.7	<0.5	3.8	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	0.6	<0.5	3.9	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	0.6	<0.5	3.5	<0.5	<0.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH9_0.2	SB10_0.3-0.4	SB11_0.3-0.5	SB11_0.9-1.1	QC01
Client sampling date / time					[28-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]
Compound	CAS Number	LOR	Unit		ES1607018-020	ES1607018-022	ES1607018-024	ES1607018-025	ES1607018-026
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	1.4	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		0.7	<0.5	3.6	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	2.0	<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		0.6	<0.5	3.1	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		5.5	<0.5	39.1	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		0.8	<0.5	4.7	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		1.1	0.6	5.0	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.4	1.2	5.2	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	100	<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	150	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	150	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
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



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH9_0.2	SB10_0.3-0.4	SB11_0.3-0.5	SB11_0.9-1.1	QC01
Client sampling date / time					[28-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]
Compound	CAS Number	LOR	Unit		ES1607018-020	ES1607018-022	ES1607018-024	ES1607018-025	ES1607018-026
					Result	Result	Result	Result	Result
EP074S: VOC Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.5	%		----	----	----	----	----
Toluene-D8	2037-26-5	0.5	%		----	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.5	%		----	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		83.8	86.1	83.8	83.5	80.8
2-Chlorophenol-D4	93951-73-6	0.5	%		91.6	93.8	90.4	91.4	88.6
2,4,6-Tribromophenol	118-79-6	0.5	%		69.4	59.3	69.2	61.5	55.8
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		111	115	111	112	110
Anthracene-d10	1719-06-8	0.5	%		111	115	112	110	107
4-Terphenyl-d14	1718-51-0	0.5	%		122	125	120	119	125
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		127	120	128	124	109
Toluene-D8	2037-26-5	0.2	%		106	90.5	100	95.4	110
4-Bromofluorobenzene	460-00-4	0.2	%		111	98.4	108	103	104



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TRIP B/K 8	----	----	----	----
Client sampling date / time				[22-Mar-2016]	----	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1607018-027	-----	-----	-----	-----	-----
				Result	Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%	3.7	----	----	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils									
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	----	----	----	----
Asbestos Type	1332-21-4	-	--	----	----	----	----	----	----
Sample weight (dry)	----	0.01	g	----	----	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	----	----	----	----	----	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	----	----	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	----	----	----	----	----	----
Chromium	7440-47-3	2	mg/kg	----	----	----	----	----	----
Copper	7440-50-8	5	mg/kg	----	----	----	----	----	----
Lead	7439-92-1	5	mg/kg	----	----	----	----	----	----
Nickel	7440-02-0	2	mg/kg	----	----	----	----	----	----
Zinc	7440-66-6	5	mg/kg	----	----	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	----	----	----	----	----	----
EN33: TCLP Leach									
Initial pH	----	0.1	pH Unit	----	----	----	----	----	----
After HCl pH	----	0.1	pH Unit	----	----	----	----	----	----
Extraction Fluid Number	----	1	-	----	----	----	----	----	----
Final pH	----	0.1	pH Unit	----	----	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	0.5	mg/kg	----	----	----	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	----	----	----	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	----	----	----	----	----	----
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	----	----	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	----	----	----	----	----
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	----	----	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	----	----	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	----	----	----	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	----	----	----	----	----	----
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	5	mg/kg	----	----	----	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	----	----	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TRIP B/K 8	----	----	----	----
Client sampling date / time					[22-Mar-2016]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1607018-027	-----	-----	-----	-----
				Result	Result	Result	Result	Result	Result
EP074B: Oxygenated Compounds - Continued									
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg		----	----	----	----	----
2-Hexanone (MBK)	591-78-6	5	mg/kg		----	----	----	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	0.5	mg/kg		----	----	----	----	----
EP074D: Fumigants									
2,2-Dichloropropane	594-20-7	0.5	mg/kg		----	----	----	----	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg		----	----	----	----	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg		----	----	----	----	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg		----	----	----	----	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg		----	----	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	5	mg/kg		----	----	----	----	----
Chloromethane	74-87-3	5	mg/kg		----	----	----	----	----
Vinyl chloride	75-01-4	5	mg/kg		----	----	----	----	----
Bromomethane	74-83-9	5	mg/kg		----	----	----	----	----
Chloroethane	75-00-3	5	mg/kg		----	----	----	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg		----	----	----	----	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg		----	----	----	----	----
Iodomethane	74-88-4	0.5	mg/kg		----	----	----	----	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg		----	----	----	----	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg		----	----	----	----	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg		----	----	----	----	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg		----	----	----	----	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg		----	----	----	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg		----	----	----	----	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg		----	----	----	----	----
Trichloroethene	79-01-6	0.5	mg/kg		----	----	----	----	----
Dibromomethane	74-95-3	0.5	mg/kg		----	----	----	----	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg		----	----	----	----	----
1,3-Dichloropropane	142-28-9	0.5	mg/kg		----	----	----	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg		----	----	----	----	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg		----	----	----	----	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg		----	----	----	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg		----	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TRIP B/K 8	----	----	----	----
Client sampling date / time					[22-Mar-2016]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1607018-027	-----	-----	-----	-----
				Result	Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg		----	----	----	----	----
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg		----	----	----	----	----
Pentachloroethane	76-01-7	0.5	mg/kg		----	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg		----	----	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg		----	----	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	0.5	mg/kg		----	----	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg		----	----	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg		----	----	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg		----	----	----	----	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg		----	----	----	----	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg		----	----	----	----	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg		----	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg		----	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg		----	----	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	0.5	mg/kg		----	----	----	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg		----	----	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg		----	----	----	----	----
Bromoform	75-25-2	0.5	mg/kg		----	----	----	----	----
EP074H: Naphthalene									
Naphthalene	91-20-3	1	mg/kg		----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		----	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		----	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		----	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg		----	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		----	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg		----	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		----	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg		----	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg		----	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		----	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TRIP B/K 8	----	----	----	----
Client sampling date / time					[22-Mar-2016]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1607018-027	-----	-----	-----	-----
				Result		Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		----	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		----	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		----	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		----	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		----	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		----	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		----	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		----	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		----	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg		----	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		----	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		----	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		----	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		----	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		----	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		----	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		----	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		----	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		----	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		----	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	----	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TRIP B/K 8	----	----	----	----
Client sampling date / time					[22-Mar-2016]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1607018-027	-----	-----	-----	-----
					Result	Result	Result	Result	Result
EP074S: VOC Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.5	%		----	----	----	----	----
Toluene-D8	2037-26-5	0.5	%		----	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.5	%		----	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		----	----	----	----	----
2,4,6-Tribromophenol	118-79-6	0.5	%		----	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		----	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		104	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		110	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		115	----	----	----	----



Analytical Results

Sub-Matrix: **TCLP LEACHATE**
 (Matrix: **WATER**)

Client sample ID

				BH2_3.8-4.0	BH6_0.4	----	----	----
Client sampling date / time				[22-Mar-2016]	[28-Mar-2016]	----	----	----
Compound	CAS Number	LOR	Unit	ES1607018-006	ES1607018-014	-----	-----	-----
				Result	Result	Result	Result	Result
EG005C: Leachable Metals by ICPAES								
Arsenic	7440-38-2	0.1	mg/L	<0.1	<0.1	----	----	----
Cadmium	7440-43-9	0.05	mg/L	<0.05	<0.05	----	----	----
Lead	7439-92-1	0.1	mg/L	<0.1	<0.1	----	----	----
Nickel	7440-02-0	0.1	mg/L	<0.1	<0.1	----	----	----
EG035C: Leachable Mercury by FIMS								
Mercury	7439-97-6	0.001	mg/L	<0.0010	<0.0010	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	56.9	34.6	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%	70.4	70.0	----	----	----
2,4,6-Tribromophenol	118-79-6	1	%	92.0	76.6	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	93.7	81.4	----	----	----
Anthracene-d10	1719-06-8	1	%	96.9	83.1	----	----	----
4-Terphenyl-d14	1718-51-0	1	%	89.7	79.2	----	----	----

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	BH1_0.2-0.3 - [22-Mar-2016]	Pale brown clay soil
EA200: Description	BH2_0.2-0.4 - [22-Mar-2016]	Mid brown clay soil
EA200: Description	BH3_0.2-0.4 - [22-Mar-2016]	Mid brown clay soil
EA200: Description	BH4_0.3 - [22-Mar-2016]	Pale brown clay soil
EA200: Description	BH5_0.5-0.6 - [22-Mar-2016]	Mid brown clay soil
EA200: Description	BH6_0.4 - [22-Mar-2016]	Mid brown clay soil with grey rocks
EA200: Description	BH7_0.2 - [22-Mar-2016]	Mid brown clay soil with grey rocks
EA200: Description	BH8_0.1 - [22-Mar-2016]	Mid brown clay soil
EA200: Description	BH9_0.2 - [22-Mar-2016]	Mid brown clay soil with grey rocks
EA200: Description	SB10_0.3-0.4 - [22-Mar-2016]	Mid brown clay soil with red rocks
EA200: Description	SB11_0.3-0.5 - [22-Mar-2016]	Mid brown clay soil with red rocks



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP074S: VOC Surrogates			
1,2-Dichloroethane-D4	17060-07-0	64	130
Toluene-D8	2037-26-5	66	136
4-Bromofluorobenzene	460-00-4	60	122
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: TCLP LEACHATE		Recovery Limits (%)	
Compound	CAS Number	Low	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

QUALITY CONTROL REPORT

Work Order	: ES1607018	Page	: 1 of 14
Client	: SULLIVAN ENVIRONMENTAL SCIENCES	Laboratory	: Environmental Division Sydney
Contact	: ADAM SULLIVAN	Contact	:
Address	: PO Box 5248 TURRAMURRA NSW 2074	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: SES_442	Date Samples Received	: 31-Mar-2016
Order number	: ----	Date Analysis Commenced	: 01-Apr-2016
C-O-C number	: ----	Issue Date	: 07-Apr-2016
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 27		
No. of samples analysed	: 21		



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos, Mayfield West, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
RICHARD TEA	Lab technician	Sydney Inorganics, Smithfield, 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: 413419)									
ES1606929-003	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	2.5	2.5	0.00	No Limit
ES1607018-001	BH1_0.2-0.3	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	20.2	20.4	1.29	0% - 20%
EA055: Moisture Content (QC Lot: 413420)									
ES1607018-013	QC02	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	16.4	17.3	4.95	0% - 50%
ES1607018-027	TRIP B/K 8	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	3.7	3.9	5.60	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 412412)									
ES1606934-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	5	6	24.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	13	8	42.4	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	9	9	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	42	38	10.7	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	37	31	18.7	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	276000	267000	3.39	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	131	118	10.9	0% - 20%
ES1607018-001	BH1_0.2-0.3	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	3	5	42.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	21	20	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	60	99	49.0	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	13	86.8	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 412414)									
ES1607018-009	BH4_0.3	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	22	23	0.00	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit



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 (%)
EG005T: Total Metals by ICP-AES (QC Lot: 412414) - continued									
ES1607018-009	BH4_0.3	EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	18	19	8.60	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	22	21	5.87	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	5	<5	0.00	No Limit
ES1607018-022	SB10_0.3-0.4	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	22	20	8.48	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	3	3	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	18	18	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	22	24	6.04	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	8	11	34.3	No Limit
		EG035T: Total Recoverable Mercury by FIMS (QC Lot: 412413)							
ES1607018-001	BH1_0.2-0.3	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1607018-022	SB10_0.3-0.4	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 411500)									
ES1607018-002	BH1_1.5-1.7	EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
	EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
EP074B: Oxygenated Compounds (QC Lot: 411500)									
ES1607018-002	BH1_1.5-1.7	EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.00	No Limit
EP074C: Sulfonated Compounds (QC Lot: 411500)									
ES1607018-002	BH1_1.5-1.7	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074D: Fumigants (QC Lot: 411500)									
ES1607018-002	BH1_1.5-1.7	EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 411500)									
ES1607018-002	BH1_1.5-1.7	EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit



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 (%)
EP074E: Halogenated Aliphatic Compounds (QC Lot: 411500) - continued									
ES1607018-002	BH1_1.5-1.7	EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.00	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 411500)									
ES1607018-002	BH1_1.5-1.7	EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074G: Trihalomethanes (QC Lot: 411500)									
ES1607018-002	BH1_1.5-1.7	EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit



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 (%)
EP074G: Trihalomethanes (QC Lot: 411500) - continued									
ES1607018-002	BH1_1.5-1.7	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074H: Naphthalene (QC Lot: 411500)									
ES1607018-002	BH1_1.5-1.7	EP074: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 411506)									
ES1607018-001	BH1_0.2-0.3	EP075(SIM): Acenaphthene	83-32-9	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): Anthracene	120-12-7	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): Benzo(a)pyrene	50-32-8	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): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			205-82-3						
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	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): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Diben(z(a,h)anthracene	53-70-3	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): Fluorene	86-73-7	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): Naphthalene	91-20-3	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): Pyrene	129-00-0	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
		ES1607018-014	BH6_0.4	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5
EP075(SIM): Acenaphthylene	208-96-8			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): Benz(a)anthracene	56-55-3			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): Benzo(a)pyrene TEQ (zero)	----			0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2			0.5	mg/kg	<0.5	<0.5	0.00	No Limit
	205-82-3								
EP075(SIM): Benzo(g,h,i)perylene	191-24-2			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): Chrysene	218-01-9			0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Diben(z(a,h)anthracene	53-70-3			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): Fluorene	86-73-7			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



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 (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 411506) - continued									
ES1607018-014	BH6_0.4	EP075(SIM): Naphthalene	91-20-3	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): Pyrene	129-00-0	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
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 411499)									
ES1607018-014	BH6_0.4	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1607018-002	BH1_1.5-1.7	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 411505)									
ES1607018-001	BH1_0.2-0.3	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
ES1607018-014	BH6_0.4	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 Petroleum Hydrocarbons (QC Lot: 411531)									
ES1607031-002	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 411499)									
ES1607018-014	BH6_0.4	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1607018-002	BH1_1.5-1.7	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: 411505)									
ES1607018-001	BH1_0.2-0.3	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
ES1607018-014	BH6_0.4	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: 411531)									
ES1607031-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 411499)									
ES1607018-014	BH6_0.4	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	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	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Toluene	108-88-3	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
ES1607018-002	BH1_1.5-1.7	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

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 Client : SULLIVAN ENVIRONMENTAL SCIENCES
 Project : SES_442



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 (%)
EP080: BTEXN (QC Lot: 411499) - continued									
ES1607018-002	BH1_1.5-1.7	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: Toluene	108-88-3	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: 411531)									
ES1607031-002	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	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: Toluene	108-88-3	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 Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005C: Leachable Metals by ICPAES (QC Lot: 412377)									
ES1606988-001	Anonymous	EG005C: Cadmium	7440-43-9	0.05	mg/L	<0.05	<0.05	0.00	No Limit
		EG005C: Arsenic	7440-38-2	0.1	mg/L	<0.1	<0.1	0.00	No Limit
		EG005C: Lead	7439-92-1	0.1	mg/L	<0.1	<0.1	0.00	No Limit
		EG005C: Nickel	7440-02-0	0.1	mg/L	<0.1	<0.1	0.00	No Limit
ES1606993-004	Anonymous	EG005C: Cadmium	7440-43-9	0.05	mg/L	<0.05	<0.05	0.00	No Limit
		EG005C: Arsenic	7440-38-2	0.1	mg/L	<0.1	<0.1	0.00	No Limit
		EG005C: Lead	7439-92-1	0.1	mg/L	0.4	0.4	0.00	No Limit
		EG005C: Nickel	7440-02-0	0.1	mg/L	<0.1	<0.1	0.00	No Limit
EG005C: Leachable Metals by ICPAES (QC Lot: 412378)									
ES1607018-014	BH6_0.4	EG005C: Cadmium	7440-43-9	0.05	mg/L	<0.05	<0.05	0.00	No Limit
		EG005C: Arsenic	7440-38-2	0.1	mg/L	<0.1	<0.1	0.00	No Limit
		EG005C: Lead	7439-92-1	0.1	mg/L	<0.1	<0.1	0.00	No Limit
		EG005C: Nickel	7440-02-0	0.1	mg/L	<0.1	<0.1	0.00	No Limit
EG035C: Leachable Mercury by FIMS (QC Lot: 412347)									
ES1606988-001	Anonymous	EG035C: Mercury	7439-97-6	0.0001	mg/L	<0.0010	<0.0010	0.00	No Limit
ES1607018-014	BH6_0.4	EG035C: Mercury	7439-97-6	0.0001	mg/L	<0.0010	<0.0010	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**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG005T: Total Metals by ICP-AES (QCLot: 412412)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	104	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	99.2	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	89.2	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	104	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	97.4	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	99.7	80	122
EG005T: Total Metals by ICP-AES (QCLot: 412414)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	102	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	97.5	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	85.8	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	104	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	101	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	97.7	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	103	80	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 412413)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	88.3	70	105
EN33: TCLP Leach (QCLot: 411457)								
EN33a: After HCl pH	----	0.1	pH Unit	1.0	----	----	----	----
EN33a: Final pH	----	0.1	pH Unit	1.0	----	----	----	----
EN33a: Initial pH	----	0.1	pH Unit	1.0	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 411500)								
EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	102	69	117
EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	101	68	118
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	94.5	65	117
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	94.5	59	125
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	99.4	66	122
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	95.1	66	118
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	101	69	119
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	97.8	67	113
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	98.8	69	115
EP074B: Oxygenated Compounds (QCLot: 411500)								
EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	10 mg/kg	94.1	58	136
EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	10 mg/kg	91.6	54	136



Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result			Low	High
EP074B: Oxygenated Compounds (QCLot: 411500) - continued								
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	10 mg/kg	92.2	62	132
EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	10 mg/kg	93.8	30	156
EP074C: Sulfonated Compounds (QCLot: 411500)								
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	102	54	126
EP074D: Fumigants (QCLot: 411500)								
EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	96.5	63	115
EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	85.9	68	124
EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	104	60	126
EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	85.7	51	119
EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	82.7	52	114
EP074E: Halogenated Aliphatic Compounds (QCLot: 411500)								
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	91.3	62	122
EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	97.0	65	117
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	92.7	65	121
EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	98.4	64	126
EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	98.8	67	125
EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	110	54	126
EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	94.0	65	123
EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	89.3	61	125
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	79.6	53	129
EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	99.5	65	125
EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	90.8	68	122
EP074: Bromomethane	74-83-9	5	mg/kg	<5	10 mg/kg	117	47	141
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	103	59	125
EP074: Chloroethane	75-00-3	5	mg/kg	<5	10 mg/kg	116	49	143
EP074: Chloromethane	74-87-3	5	mg/kg	<5	10 mg/kg	127	41	141
EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	97.2	69	121
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	78.0	55	129
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	91.7	68	118
EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	10 mg/kg	120	30	148
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	104	50	128
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	92.1	43	129
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	96.6	20	134
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	95.9	67	143
EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	98.7	64	120
EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	63.0	54	128
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	99.6	70	118
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	10 mg/kg	123	49	135



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP074E: Halogenated Aliphatic Compounds (QCLot: 411500) - continued								
EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	10 mg/kg	136	43	147
EP074F: Halogenated Aromatic Compounds (QCLot: 411500)								
EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	98.3	52	122
EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	94.2	48	122
EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	101	70	114
EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	105	70	116
EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	104	67	117
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	105	68	122
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	104	67	123
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	103	70	1147
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	96.0	68	116
EP074G: Trihalomethanes (QCLot: 411500)								
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	95.8	61	121
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	79.4	60	126
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	81.5	66	124
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	82.5	63	121
EP074H: Naphthalene (QCLot: 411500)								
EP074: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	97.8	67	129
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 411506)								
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	98.6	73	127
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	92.4	72	124
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	103	77	127
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	94.7	69	123
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	89.8	70	126
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	6 mg/kg	79.8	68	116
	205-82-3							
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	111	63	121
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	83.8	74	126
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	105	75	127
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	94.9	62	118
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	99.2	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	99.4	72	126
EP075(SIM): Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	102	61	121
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	98.9	77	125
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	99.8	75	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	102	74	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 411499)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	95.0	68	128



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Spike	Spike Recovery (%)	Recovery Limits (%)	
					Concentration	LCS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 411505)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	103	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	113	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	105	71	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 411531)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	104	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 411499)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	97.2	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 411505)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	103	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	111	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	150 mg/kg	96.2	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 411531)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	104	68	128
EP080: BTEXN (QCLot: 411499)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	81.3	62	116
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	98.9	66	118
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	93.1	63	119
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	96.4	68	120
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	84.9	67	121
EP080: BTEXN (QCLot: 411531)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	91.8	62	116
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	104	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	107	66	118
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	102	63	119
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	108	68	120
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	102	67	121

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
Method: Compound	CAS Number	LOR	Unit		Result	Spike	Spike Recovery (%)	Recovery Limits (%)	
						Concentration	LCS	Low	High
EG005C: Leachable Metals by ICPAES (QCLot: 412377)									
EG005C: Arsenic	7440-38-2	0.1	mg/L	<0.1	0.1 mg/L	112	80	124	
EG005C: Cadmium	7440-43-9	0.05	mg/L	<0.05	0.1 mg/L	102	80	118	
EG005C: Lead	7439-92-1	0.1	mg/L	<0.1	0.1 mg/L	100	80	118	
EG005C: Nickel	7440-02-0	0.1	mg/L	<0.1	0.1 mg/L	102	83	115	



Sub-Matrix: **WATER**

Method: Compound				Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
						LCS	Low	High
CAS Number	LOR	Unit						
EG005C: Leachable Metals by ICPAES (QCLot: 412378)								
EG005C: Arsenic	7440-38-2	0.1	mg/L	<0.1	0.1 mg/L	112	80	124
EG005C: Cadmium	7440-43-9	0.05	mg/L	<0.05	0.1 mg/L	102	80	118
EG005C: Lead	7439-92-1	0.1	mg/L	<0.1	0.1 mg/L	96.5	80	118
EG005C: Nickel	7440-02-0	0.1	mg/L	<0.1	0.1 mg/L	100	83	115
EG035C: Leachable Mercury by FIMS (QCLot: 412347)								
EG035C: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	91.9	79	109
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 412590)								
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	94.0	63	117

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**

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
EG005T: Total Metals by ICP-AES (QCLot: 412412)							
ES1607018-001	BH1_0.2-0.3	EG005T: Arsenic	7440-38-2	50 mg/kg	80.8	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	81.3	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	84.6	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	82.3	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	74.5	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	81.9	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	82.1	70	130
EG005T: Total Metals by ICP-AES (QCLot: 412414)							
ES1607018-009	BH4_0.3	EG005T: Arsenic	7440-38-2	50 mg/kg	76.6	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	98.8	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	97.0	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	105	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	94.4	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	100	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	96.8	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 412413)							
ES1607018-001	BH1_0.2-0.3	EG035T: Mercury	7439-97-6	5 mg/kg	102	70	130
EP074E: Halogenated Aliphatic Compounds (QCLot: 411500)							
ES1607018-002	BH1_1.5-1.7	EP074: 1.1-Dichloroethene	75-35-4	2.5 mg/kg	84.8	70	130
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	80.6	70	130

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 Work Order : ES1607018
 Client : SULLIVAN ENVIRONMENTAL SCIENCES
 Project : SES_442



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
EP074F: Halogenated Aromatic Compounds (QCLot: 411500)							
ES1607018-002	BH1_1.5-1.7	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	81.8	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 411506)							
ES1607018-001	BH1_0.2-0.3	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	84.7	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	86.6	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 411499)							
ES1607018-002	BH1_1.5-1.7	EP080: C6 - C9 Fraction	----	32.5 mg/kg	121	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 411505)							
ES1607018-001	BH1_0.2-0.3	EP071: C10 - C14 Fraction	----	523 mg/kg	87.0	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	105	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	124	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 411531)							
ES1607031-002	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	126	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 411499)							
ES1607018-002	BH1_1.5-1.7	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	121	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 411505)							
ES1607018-001	BH1_0.2-0.3	EP071: >C10 - C16 Fraction	----	860 mg/kg	102	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	119	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	118	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 411531)							
ES1607031-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	123	70	130
EP080: BTEXN (QCLot: 411499)							
ES1607018-002	BH1_1.5-1.7	EP080: Benzene	71-43-2	2.5 mg/kg	85.9	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	99.6	70	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	104	70	130
			106-42-3				
		EP080: Naphthalene	91-20-3	2.5 mg/kg	93.7	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	104	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	90.1	70	130
EP080: BTEXN (QCLot: 411531)							
ES1607031-002	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	98.1	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	108	70	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	110	70	130
			106-42-3				
		EP080: Naphthalene	91-20-3	2.5 mg/kg	107	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	114	70	130
	EP080: Toluene	108-88-3	2.5 mg/kg	106	70	130	



Sub-Matrix: WATER

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005C: Leachable Metals by ICPAES (QCLot: 412377)							
ES1606988-002	Anonymous	EG005C: Arsenic	7440-38-2	1 mg/L	110	70	130
		EG005C: Cadmium	7440-43-9	0.25 mg/L	104	70	130
		EG005C: Lead	7439-92-1	1 mg/L	104	70	130
		EG005C: Nickel	7440-02-0	1 mg/L	102	70	130
EG035C: Leachable Mercury by FIMS (QCLot: 412347)							
ES1606988-002	Anonymous	EG035C: Mercury	7439-97-6	0.01 mg/L	89.8	70	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES1607018	Page	: 1 of 10
Client	: SULLIVAN ENVIRONMENTAL SCIENCES	Laboratory	: Environmental Division Sydney
Contact	: ADAM SULLIVAN	Telephone	: +61-2-8784 8555
Project	: SES_442	Date Samples Received	: 31-Mar-2016
Site	: ----	Issue Date	: 07-Apr-2016
Sampler	: ----	No. of samples received	: 27
Order number	: ----	No. of samples analysed	: 21

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.
- Surrogate recovery outliers exist for all regular sample matrices - please see following pages for full details.

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.

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 Work Order : ES1607018
 Client : SULLIVAN ENVIRONMENTAL SCIENCES
 Project : SES_442



Regular Sample Surrogates

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP075(SIM)S: Phenolic Compound Surrogates	ES1607018-006	BH2_3.8-4.0	Phenol-d6	13127-88-3	56.9 %	10-44 %	Recovery greater than upper data quality objective

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method		Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EP074A: Monocyclic Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved							
BH1_1.5-1.7,	BH2_3.8-4.0	01-Apr-2016	29-Mar-2016	3	04-Apr-2016	29-Mar-2016	6

Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Method Blanks (MB)					
TCLP for Non & Semivolatile Analytes	0	11	0.00	9.09	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	15	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Leachable Metals by ICPAES	1	21	4.76	5.00	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	0	15	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	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation



Matrix: **SOIL**

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content								
Soil Glass Jar - Unpreserved (EA055-103)		22-Mar-2016	----	----	----	04-Apr-2016	05-Apr-2016	✓
BH1_0.2-0.3, BH2_0.2-0.4, BH3_0.2-0.4, BH4_0.3, SB11_0.3-0.5, QC01,	BH1_1.5-1.7, BH2_3.8-4.0, BH3_1.8-2.0, SB10_0.3-0.4, SB11_0.9-1.1, TRIP B/K 8							
Soil Glass Jar - Unpreserved (EA055-103)		28-Mar-2016	----	----	----	04-Apr-2016	11-Apr-2016	✓
BH5_0.5-0.6, QC02, BH6_3.0, BH8_0.1, BH9_0.2	BH5_2.5-2.8, BH6_0.4, BH7_0.2, BH8_1.1,							
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Snap Lock Bag: Separate bag received (EA200)		22-Mar-2016	----	----	----	04-Apr-2016	18-Sep-2016	✓
BH1_0.2-0.3, BH3_0.2-0.4, BH5_0.5-0.6, BH7_0.2, BH9_0.2, SB11_0.3-0.5	BH2_0.2-0.4, BH4_0.3, BH6_0.4, BH8_0.1, SB10_0.3-0.4,							
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)		22-Mar-2016	04-Apr-2016	18-Sep-2016	✓	04-Apr-2016	18-Sep-2016	✓
BH1_0.2-0.3, BH2_0.2-0.4, BH3_0.2-0.4, BH4_0.3, SB11_0.3-0.5, QC01	BH1_1.5-1.7, BH2_3.8-4.0, BH3_1.8-2.0, SB10_0.3-0.4, SB11_0.9-1.1,							
Soil Glass Jar - Unpreserved (EG005T)		28-Mar-2016	04-Apr-2016	24-Sep-2016	✓	04-Apr-2016	24-Sep-2016	✓
BH5_0.5-0.6, QC02, BH6_3.0, BH8_0.1, BH9_0.2	BH5_2.5-2.8, BH6_0.4, BH7_0.2, BH8_1.1,							



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T)								
BH1_0.2-0.3, BH2_0.2-0.4, BH3_0.2-0.4, BH4_0.3, SB11_0.3-0.5, QC01	BH1_1.5-1.7, BH2_3.8-4.0, BH3_1.8-2.0, SB10_0.3-0.4, SB11_0.9-1.1,	22-Mar-2016	04-Apr-2016	19-Apr-2016	✔	04-Apr-2016	19-Apr-2016	✔
Soil Glass Jar - Unpreserved (EG035T)								
BH5_0.5-0.6, QC02, BH6_3.0, BH8_0.1, BH9_0.2	BH5_2.5-2.8, BH6_0.4, BH7_0.2, BH8_1.1,	28-Mar-2016	04-Apr-2016	25-Apr-2016	✔	04-Apr-2016	25-Apr-2016	✔
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP071)								
BH1_0.2-0.3, BH2_0.2-0.4, BH3_0.2-0.4, BH4_0.3, SB11_0.3-0.5, QC01	BH1_1.5-1.7, BH2_3.8-4.0, BH3_1.8-2.0, SB10_0.3-0.4, SB11_0.9-1.1,	22-Mar-2016	01-Apr-2016	05-Apr-2016	✔	04-Apr-2016	11-May-2016	✔
Soil Glass Jar - Unpreserved (EP071)								
BH5_0.5-0.6, QC02, BH6_3.0, BH8_0.1, BH9_0.2	BH5_2.5-2.8, BH6_0.4, BH7_0.2, BH8_1.1,	28-Mar-2016	01-Apr-2016	11-Apr-2016	✔	04-Apr-2016	11-May-2016	✔
EP074A: Monocyclic Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP074)								
BH1_1.5-1.7,	BH2_3.8-4.0	22-Mar-2016	01-Apr-2016	29-Mar-2016	✖	04-Apr-2016	29-Mar-2016	✖
Soil Glass Jar - Unpreserved (EP074)								
BH6_3.0		28-Mar-2016	01-Apr-2016	04-Apr-2016	✔	04-Apr-2016	04-Apr-2016	✔



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP075(SIM))								
BH1_0.2-0.3, BH2_0.2-0.4, BH3_0.2-0.4, BH4_0.3, SB11_0.3-0.5, QC01	BH1_1.5-1.7, BH2_3.8-4.0, BH3_1.8-2.0, SB10_0.3-0.4, SB11_0.9-1.1,	22-Mar-2016	01-Apr-2016	05-Apr-2016	✔	03-Apr-2016	11-May-2016	✔
Soil Glass Jar - Unpreserved (EP075(SIM))								
BH5_0.5-0.6, QC02, BH6_3.0, BH8_0.1, BH9_0.2	BH5_2.5-2.8, BH6_0.4, BH7_0.2, BH8_1.1,	28-Mar-2016	01-Apr-2016	11-Apr-2016	✔	03-Apr-2016	11-May-2016	✔
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080)								
TRIP B/K 8		22-Mar-2016	01-Apr-2016	05-Apr-2016	✔	05-Apr-2016	05-Apr-2016	✔
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP080)								
BH1_0.2-0.3, BH2_0.2-0.4, BH3_0.2-0.4, BH4_0.3, SB11_0.3-0.5, QC01	BH1_1.5-1.7, BH2_3.8-4.0, BH3_1.8-2.0, SB10_0.3-0.4, SB11_0.9-1.1,	22-Mar-2016	01-Apr-2016	05-Apr-2016	✔	04-Apr-2016	05-Apr-2016	✔
Soil Glass Jar - Unpreserved (EP080)								
BH5_0.5-0.6, QC02, BH6_3.0, BH8_0.1, BH9_0.2	BH5_2.5-2.8, BH6_0.4, BH7_0.2, BH8_1.1,	28-Mar-2016	01-Apr-2016	11-Apr-2016	✔	04-Apr-2016	11-Apr-2016	✔

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG005C: Leachable Metals by ICPAES							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG005C) BH2_3.8-4.0, BH6_0.4	01-Apr-2016	04-Apr-2016	28-Sep-2016	✓	04-Apr-2016	28-Sep-2016	✓
EG035C: Leachable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035C) BH2_3.8-4.0, BH6_0.4	01-Apr-2016	----	----	----	04-Apr-2016	29-Apr-2016	✓



Matrix: **WATER**Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) BH2_3.8-4.0, BH6_0.4	01-Apr-2016	04-Apr-2016	08-Apr-2016	✔	05-Apr-2016	14-May-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)	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	4	34	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	3	26	11.54	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	3	33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	34	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	26	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TCLP for Non & Semivolatile Analytes	EN33a	0	11	0.00	9.09	✗	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	34	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	26	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	34	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	26	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	3	33.33	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	
Laboratory Duplicates (DUP)							
Leachable Mercury by FIMS	EG035C	2	11	18.18	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Leachable Metals by ICPAES	EG005C	3	21	14.29	10.00	✔	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	
Laboratory Duplicates (DUP) - Continued							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	15	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Leachable Mercury by FIMS	EG035C	1	11	9.09	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Leachable Metals by ICPAES	EG005C	2	21	9.52	5.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	15	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Leachable Mercury by FIMS	EG035C	1	11	9.09	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Leachable Metals by ICPAES	EG005C	2	21	9.52	5.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	15	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Leachable Mercury by FIMS	EG035C	1	11	9.09	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Leachable Metals by ICPAES	EG005C	1	21	4.76	5.00	✖	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	15	0.00	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
Leachable Metals by ICPAES	EG005C	SOIL	In house: referenced to APHA 3120; USEPA SW 846 - 6010: The ICPAES technique ionises leachate sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (2013) Schedule B(3)
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)
Leachable Mercury by FIMS	EG035C	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the TCLP solution. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ 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)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(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 SnCl ₂ 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)
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.
Volatile Organic Compounds	EP074	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. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
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.
Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals in TCLP Leachate	EN25C	SOIL	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)



Preparation Methods	Method	Matrix	Method Descriptions
TCLP for Non & Semivolatile Analytes	EN33a	SOIL	In house QWI-EN/33 referenced to USEPA SW846-1311: The TCLP procedure is designed to determine the mobility of both organic and inorganic analytes present in wastes. The standard TCLP leach is for non-volatile and Semivolatile test parameters.
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)
Separatory Funnel Extraction of Liquids	ORG14	SOIL	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.
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.

**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : ES1607018**

Client	: SULLIVAN ENVIRONMENTAL SCIENCES	Laboratory	: Environmental Division Sydney
Contact	: ADAM SULLIVAN	Contact	:
Address	: PO Box 5248 TURRAMURRA NSW 2074	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: adam@sullivan-es.com.au	E-mail	:
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: SES_442	Page	: 1 of 3
Order number	: ----	Quote number	: ES2015SULENV0034 (SYBQ-207-15)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	:		

Dates

Date Samples Received	: 31-Mar-2016 2:00 PM	Issue Date	: 01-Apr-2016
Client Requested Due Date	: 07-Apr-2016	Scheduled Reporting Date	: 07-Apr-2016

Delivery Details

Mode of Delivery	: Undefined	Security Seal	: Intact.
No. of coolers/boxes	: ----	Temperature	: 5.8' C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 27 / 21

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
- **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.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **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 - EA055-103 Moisture Content	SOIL - EA200 Asbestos Identification in Soils -	SOIL - EG005C Leachable Metals by ICPAES	SOIL - EG035C Leachable Mercury by FIMS	SOIL - EP074 (solids) Volatile Organic Compounds	SOIL - S-26 8 metals/TRH/BTEXN/PAH
ES1607018-001	[22-Mar-2016]	BH1_0.2-0.3		✓	✓				✓
ES1607018-002	[22-Mar-2016]	BH1_1.5-1.7		✓				✓	✓
ES1607018-003	[22-Mar-2016]	BH1_3.1-3.3	✓						
ES1607018-004	[22-Mar-2016]	BH2_0.2-0.4		✓	✓				✓
ES1607018-005	[22-Mar-2016]	BH2_1.8-2.0	✓						
ES1607018-006	[22-Mar-2016]	BH2_3.8-4.0		✓		✓	✓	✓	✓
ES1607018-007	[22-Mar-2016]	BH3_0.2-0.4		✓	✓				✓
ES1607018-008	[22-Mar-2016]	BH3_1.8-2.0		✓					✓
ES1607018-009	[22-Mar-2016]	BH4_0.3		✓	✓				✓
ES1607018-010	[22-Mar-2016]	BH4_3.0	✓						
ES1607018-011	[28-Mar-2016]	BH5_0.5-0.6		✓	✓				✓
ES1607018-012	[28-Mar-2016]	BH5_2.5-2.8		✓					✓
ES1607018-013	[28-Mar-2016]	QC02		✓					✓
ES1607018-014	[28-Mar-2016]	BH6_0.4		✓	✓	✓	✓		✓
ES1607018-015	[28-Mar-2016]	BH6_3.0		✓				✓	✓
ES1607018-016	[28-Mar-2016]	BH7_0.2		✓	✓				✓
ES1607018-017	[28-Mar-2016]	BH7_0.9	✓						
ES1607018-018	[28-Mar-2016]	BH8_0.1		✓	✓				✓
ES1607018-019	[28-Mar-2016]	BH8_1.1		✓					✓
ES1607018-020	[28-Mar-2016]	BH9_0.2		✓	✓				✓
ES1607018-021	[28-Mar-2016]	BH9_1.0	✓						
ES1607018-022	[22-Mar-2016]	SB10_0.3-0.4		✓	✓				✓
ES1607018-023	[22-Mar-2016]	SB10_0.8	✓						
ES1607018-024	[22-Mar-2016]	SB11_0.3-0.5		✓	✓				✓
ES1607018-025	[22-Mar-2016]	SB11_0.9-1.1		✓					✓
ES1607018-026	[22-Mar-2016]	QC01		✓					✓
ES1607018-027	[22-Mar-2016]	TRIP B/K 8		✓					



Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EP075 SIM PAH only SIM - PAH only	SOIL - EP080 BTEXN
ES1607018-006	[22-Mar-2016]	BH2_3.8-4.0	✓	
ES1607018-014	[28-Mar-2016]	BH6_0.4	✓	
ES1607018-027	[22-Mar-2016]	TRIP B/K 8		✓

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **SOIL**

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

Method Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received		Instructions Received	
				Date	Evaluation	Date	Evaluation
EP074: Volatile Organic Compounds							
BH1_1.5-1.7	Soil Glass Jar - Unpreserved	29-Mar-2016	29-Mar-2016	31-Mar-2016	✗	----	----
BH2_3.8-4.0	Soil Glass Jar - Unpreserved	29-Mar-2016	29-Mar-2016	31-Mar-2016	✗	----	----

Requested Deliverables

ADAM SULLIVAN

- *AU Certificate of Analysis - NATA (COA)	Email	adam@sullivan-es.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	adam@sullivan-es.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	adam@sullivan-es.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	adam@sullivan-es.com.au
- A4 - AU Tax Invoice (INV)	Email	adam@sullivan-es.com.au
- Chain of Custody (CoC) (COC)	Email	adam@sullivan-es.com.au
- EDI Format - XTab (XTAB)	Email	adam@sullivan-es.com.au

CERTIFICATE OF ANALYSIS

Work Order : **ES1607425**
Client : **SULLIVAN ENVIRONMENTAL SCIENCES**
Contact : ADAM SULLIVAN
Address : PO Box 5248
 TURRAMURRA NSW 2074
Telephone : ----
Project : SES_442
Order number : ----
C-O-C number : ----
Sampler : ADAM SULLIVAN
Site : ----
Quote number : ----
No. of samples received : 6
No. of samples analysed : 6

Page : 1 of 11
Laboratory : Environmental Division Sydney
Contact :
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 06-Apr-2016 14:00
Date Analysis Commenced : 07-Apr-2016
Issue Date : 12-Apr-2016 17:57

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 Certificate of Analysis contains the following information:

- General Comments
- Analytical 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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, 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.

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.

- 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: **WATER**
 (Matrix: **WATER**)

Client sample ID

				BH1	BH4	QA	BH5	BH6
Client sampling date / time				[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]
Compound	CAS Number	LOR	Unit	ES1607425-001	ES1607425-002	ES1607425-003	ES1607425-004	ES1607425-005
				Result	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	<0.001
Cadmium	7440-43-9	0.0001	mg/L	0.0576	0.0004	0.0004	0.0010	0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.026	0.002	0.002	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L	0.182	0.057	0.060	0.316	0.010
Zinc	7440-66-6	0.005	mg/L	0.397	0.114	0.117	0.872	0.014
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	5	µg/L	<5	<5	<5	<5	<5
Isopropylbenzene	98-82-8	5	µg/L	<5	<5	<5	<5	<5
n-Propylbenzene	103-65-1	5	µg/L	<5	<5	<5	<5	<5
1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	<5	<5	<5
sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	<5	<5	<5
1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	<5	<5	<5
tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	<5	<5	<5
p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	<5	<5	<5
n-Butylbenzene	104-51-8	5	µg/L	<5	<5	<5	<5	<5
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	50	µg/L	<50	<50	<50	<50	<50
2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	<50	<50	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	<50	<50	<50
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	<50	<50	<50
EP074C: Sulfonated Compounds								
Carbon disulfide	75-15-0	5	µg/L	<5	<5	<5	<5	<5
EP074D: Fumigants								
2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	<5	<5	<5
1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	<5	<5	<5
cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	<5	<5	<5
trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	<5	<5	<5
1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	<5	<5	<5
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	<50	<50	<50



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				BH1	BH4	QA	BH5	BH6
Client sampling date / time				[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]
Compound	CAS Number	LOR	Unit	ES1607425-001	ES1607425-002	ES1607425-003	ES1607425-004	ES1607425-005
				Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued								
Chloromethane	74-87-3	50	µg/L	<50	<50	<50	<50	<50
Vinyl chloride	75-01-4	50	µg/L	<50	<50	<50	<50	<50
Bromomethane	74-83-9	50	µg/L	<50	<50	<50	<50	<50
Chloroethane	75-00-3	50	µg/L	<50	<50	<50	<50	<50
Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	<50	<50	<50
1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	<5	<5	<5
Iodomethane	74-88-4	5	µg/L	<5	<5	<5	<5	<5
trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	<5	<5	<5
1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	<5	<5	<5
cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	<5	<5	<5
1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	<5	<5	<5
1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	<5	<5	<5
Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	<5	<5	<5
1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	<5	<5	<5
Trichloroethene	79-01-6	5	µg/L	<5	<5	<5	<5	<5
Dibromomethane	74-95-3	5	µg/L	<5	<5	<5	<5	<5
1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	<5	<5	<5
1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	<5	<5	<5
Tetrachloroethene	127-18-4	5	µg/L	<5	<5	<5	<5	<5
1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	<5	<5	<5
trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	<5	<5	<5
cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	<5	<5	<5
1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	<5	<5	<5	<5
Pentachloroethane	76-01-7	5	µg/L	<5	<5	<5	<5	<5
1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	<5	<5	<5
Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	<5	<5	<5
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	5	µg/L	<5	<5	<5	<5	<5
Bromobenzene	108-86-1	5	µg/L	<5	<5	<5	<5	<5
2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	<5	<5	<5
4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	<5	<5	<5
1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	<5	<5	<5
1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	<5	<5	<5
1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	<5	<5	<5



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	BH1	BH4	QA	BH5	BH6
Client sampling date / time					[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]
Compound	CAS Number	LOR	Unit		ES1607425-001	ES1607425-002	ES1607425-003	ES1607425-004	ES1607425-005
					Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds - Continued									
1,2,4-Trichlorobenzene	120-82-1	5	µg/L		<5	<5	<5	<5	<5
1,2,3-Trichlorobenzene	87-61-6	5	µg/L		<5	<5	<5	<5	<5
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	<5	<5	<5	9
Bromodichloromethane	75-27-4	5	µg/L		<5	<5	<5	<5	<5
Dibromochloromethane	124-48-1	5	µg/L		<5	<5	<5	<5	<5
Bromoform	75-25-2	5	µg/L		<5	<5	<5	<5	<5
EP074H: Naphthalene									
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	1.8
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L		<1.0	<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	<1.0
Chrysene	218-01-9	1	µg/L		<1.0	<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	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	<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	<0.5
Indeno(1,2,3.cd)pyrene	193-39-5	1	µg/L		<1.0	<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	<1.0
Benzo(g,h,i)perylene	191-24-2	1	µg/L		<1.0	<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	1.8
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	120	160
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	1320	1030
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	620	470
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	2060	1660



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				BH1	BH4	QA	BH5	BH6
Client sampling date / time				[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]
Compound	CAS Number	LOR	Unit	ES1607425-001	ES1607425-002	ES1607425-003	ES1607425-004	ES1607425-005
				Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	210	220
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	1540	1190
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	420	310
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	2170	1720
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	210	220
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	4	4
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	4	4
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP074S: VOC Surrogates								
1,2-Dichloroethane-D4	17060-07-0	5	%	120	118	120	124	118
Toluene-D8	2037-26-5	5	%	117	118	119	122	117
4-Bromofluorobenzene	460-00-4	5	%	103	104	102	104	101
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	34.5	27.4	18.5	33.4	36.2
2-Chlorophenol-D4	93951-73-6	1	%	71.5	61.7	48.2	67.4	52.2
2,4,6-Tribromophenol	118-79-6	1	%	58.5	67.0	62.0	71.7	54.4
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	67.7	66.2	66.8	88.1	50.5
Anthracene-d10	1719-06-8	1	%	98.8	85.4	87.9	91.8	76.0
4-Terphenyl-d14	1718-51-0	1	%	72.7	77.3	69.4	71.8	73.8
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	2	%	113	111	114	117	111
Toluene-D8	2037-26-5	2	%	112	112	114	117	112
4-Bromofluorobenzene	460-00-4	2	%	107	107	106	108	105



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Client sample ID

				TB	----	----	----	----
Client sampling date / time				[05-Apr-2016]	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1607425-006	-----	-----	-----	-----
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	----	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	----	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	----	----	----	----	----
Copper	7440-50-8	0.001	mg/L	----	----	----	----	----
Lead	7439-92-1	0.001	mg/L	----	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	----	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	----	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	----	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	5	µg/L	----	----	----	----	----
Isopropylbenzene	98-82-8	5	µg/L	----	----	----	----	----
n-Propylbenzene	103-65-1	5	µg/L	----	----	----	----	----
1,3,5-Trimethylbenzene	108-67-8	5	µg/L	----	----	----	----	----
sec-Butylbenzene	135-98-8	5	µg/L	----	----	----	----	----
1,2,4-Trimethylbenzene	95-63-6	5	µg/L	----	----	----	----	----
tert-Butylbenzene	98-06-6	5	µg/L	----	----	----	----	----
p-Isopropyltoluene	99-87-6	5	µg/L	----	----	----	----	----
n-Butylbenzene	104-51-8	5	µg/L	----	----	----	----	----
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	50	µg/L	----	----	----	----	----
2-Butanone (MEK)	78-93-3	50	µg/L	----	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	----	----	----	----	----
2-Hexanone (MBK)	591-78-6	50	µg/L	----	----	----	----	----
EP074C: Sulfonated Compounds								
Carbon disulfide	75-15-0	5	µg/L	----	----	----	----	----
EP074D: Fumigants								
2,2-Dichloropropane	594-20-7	5	µg/L	----	----	----	----	----
1,2-Dichloropropane	78-87-5	5	µg/L	----	----	----	----	----
cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	----	----	----	----	----
trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	----	----	----	----	----
1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	----	----	----	----	----
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	50	µg/L	----	----	----	----	----



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Client sample ID

				TB	----	----	----	----
Client sampling date / time				[05-Apr-2016]	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1607425-006	-----	-----	-----	-----
				Result	Result	Result	Result	Result

EP074E: Halogenated Aliphatic Compounds - Continued

Chloromethane	74-87-3	50	µg/L	----	----	----	----	----
Vinyl chloride	75-01-4	50	µg/L	----	----	----	----	----
Bromomethane	74-83-9	50	µg/L	----	----	----	----	----
Chloroethane	75-00-3	50	µg/L	----	----	----	----	----
Trichlorofluoromethane	75-69-4	50	µg/L	----	----	----	----	----
1,1-Dichloroethene	75-35-4	5	µg/L	----	----	----	----	----
Iodomethane	74-88-4	5	µg/L	----	----	----	----	----
trans-1,2-Dichloroethene	156-60-5	5	µg/L	----	----	----	----	----
1,1-Dichloroethane	75-34-3	5	µg/L	----	----	----	----	----
cis-1,2-Dichloroethene	156-59-2	5	µg/L	----	----	----	----	----
1,1,1-Trichloroethane	71-55-6	5	µg/L	----	----	----	----	----
1,1-Dichloropropylene	563-58-6	5	µg/L	----	----	----	----	----
Carbon Tetrachloride	56-23-5	5	µg/L	----	----	----	----	----
1,2-Dichloroethane	107-06-2	5	µg/L	----	----	----	----	----
Trichloroethene	79-01-6	5	µg/L	----	----	----	----	----
Dibromomethane	74-95-3	5	µg/L	----	----	----	----	----
1,1,2-Trichloroethane	79-00-5	5	µg/L	----	----	----	----	----
1,3-Dichloropropane	142-28-9	5	µg/L	----	----	----	----	----
Tetrachloroethene	127-18-4	5	µg/L	----	----	----	----	----
1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	----	----	----	----	----
trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	----	----	----	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	----	----	----	----	----
1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	----	----	----	----	----
1,2,3-Trichloropropane	96-18-4	5	µg/L	----	----	----	----	----
Pentachloroethane	76-01-7	5	µg/L	----	----	----	----	----
1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	----	----	----	----	----
Hexachlorobutadiene	87-68-3	5	µg/L	----	----	----	----	----

EP074F: Halogenated Aromatic Compounds

Chlorobenzene	108-90-7	5	µg/L	----	----	----	----	----
Bromobenzene	108-86-1	5	µg/L	----	----	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L	----	----	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L	----	----	----	----	----
1,3-Dichlorobenzene	541-73-1	5	µg/L	----	----	----	----	----
1,4-Dichlorobenzene	106-46-7	5	µg/L	----	----	----	----	----
1,2-Dichlorobenzene	95-50-1	5	µg/L	----	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TB	----	----	----	----
Client sampling date / time					[05-Apr-2016]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1607425-006	-----	-----	-----	-----
					Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds - Continued									
1,2,4-Trichlorobenzene	120-82-1	5	µg/L		----	----	----	----	----
1,2,3-Trichlorobenzene	87-61-6	5	µg/L		----	----	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		----	----	----	----	----
Bromodichloromethane	75-27-4	5	µg/L		----	----	----	----	----
Dibromochloromethane	124-48-1	5	µg/L		----	----	----	----	----
Bromoform	75-25-2	5	µg/L		----	----	----	----	----
EP074H: Naphthalene									
Naphthalene	91-20-3	5	µg/L		----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		----	----	----	----	----
Acenaphthylene	208-96-8	1	µg/L		----	----	----	----	----
Acenaphthene	83-32-9	1	µg/L		----	----	----	----	----
Fluorene	86-73-7	1	µg/L		----	----	----	----	----
Phenanthrene	85-01-8	1	µg/L		----	----	----	----	----
Anthracene	120-12-7	1	µg/L		----	----	----	----	----
Fluoranthene	206-44-0	1	µg/L		----	----	----	----	----
Pyrene	129-00-0	1	µg/L		----	----	----	----	----
Benz(a)anthracene	56-55-3	1	µg/L		----	----	----	----	----
Chrysene	218-01-9	1	µg/L		----	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L		----	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		----	----	----	----	----
Indeno(1,2,3.cd)pyrene	193-39-5	1	µg/L		----	----	----	----	----
Dibenz(a,h)anthracene	53-70-3	1	µg/L		----	----	----	----	----
Benzo(g,h,i)perylene	191-24-2	1	µg/L		----	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		----	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		----	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		----	----	----	----	----
C10 - C14 Fraction	----	50	µg/L		----	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		----	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		----	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		----	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TB	----	----	----	----
Client sampling date / time					[05-Apr-2016]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1607425-006	-----	-----	-----	-----
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		----	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		----	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		----	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		----	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		----	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		----	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		----	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L		<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP074S: VOC Surrogates									
1,2-Dichloroethane-D4	17060-07-0	5	%		----	----	----	----	----
Toluene-D8	2037-26-5	5	%		----	----	----	----	----
4-Bromofluorobenzene	460-00-4	5	%		----	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		----	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%		----	----	----	----	----
2,4,6-Tribromophenol	118-79-6	1	%		----	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		----	----	----	----	----
Anthracene-d10	1719-06-8	1	%		----	----	----	----	----
4-Terphenyl-d14	1718-51-0	1	%		----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%		116	----	----	----	----
Toluene-D8	2037-26-5	2	%		117	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		109	----	----	----	----



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP074S: VOC Surrogates			
1,2-Dichloroethane-D4	17060-07-0	78	133
Toluene-D8	2037-26-5	79	129
4-Bromofluorobenzene	460-00-4	81	124
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	: ES1607425	Page	: 1 of 11
Client	: SULLIVAN ENVIRONMENTAL SCIENCES	Laboratory	: Environmental Division Sydney
Contact	: ADAM SULLIVAN	Contact	:
Address	: PO Box 5248 TURRAMURRA NSW 2074	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: SES_442	Date Samples Received	: 06-Apr-2016
Order number	: ----	Date Analysis Commenced	: 07-Apr-2016
C-O-C number	: ----	Issue Date	: 12-Apr-2016
Sampler	: ADAM SULLIVAN		
Site	: ----		
Quote number	: ----		
No. of samples received	: 6		
No. of samples analysed	: 6		



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, 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: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 417055)									
ES1607425-003	QA	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0004	0.0004	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	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	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	0.060	0.053	11.8	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.117	0.109	7.12	0% - 20%
ES1607406-013	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0010	<0.0010	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.010	<0.010	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.010	<0.010	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.010	<0.010	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.010	<0.010	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.010	<0.010	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.050	<0.050	0.00	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 417057)									
ES1607406-023	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
ES1607427-002	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 416168)									
ES1607425-001	BH1	EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 416168) - continued									
ES1607425-001	BH1	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.00	No Limit
ES1607447-003	Anonymous	EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.00	No Limit
EP074B: Oxygenated Compounds (QC Lot: 416168)									
ES1607425-001	BH1	EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.00	No Limit
		EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.00	No Limit
ES1607447-003	Anonymous	EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.00	No Limit
		EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.00	No Limit
EP074C: Sulfonated Compounds (QC Lot: 416168)									
ES1607425-001	BH1	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.00	No Limit
ES1607447-003	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.00	No Limit
EP074D: Fumigants (QC Lot: 416168)									
ES1607425-001	BH1	EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.00	No Limit
ES1607447-003	Anonymous	EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.00	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 416168)									
ES1607425-001	BH1	EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.00	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP074E: Halogenated Aliphatic Compounds (QC Lot: 416168) - continued									
ES1607425-001	BH1	EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.00	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.00	No Limit
ES1607447-003	Anonymous	EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP074E: Halogenated Aliphatic Compounds (QC Lot: 416168) - continued									
ES1607447-003	Anonymous	EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.00	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.00	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 416168)									
ES1607425-001	BH1	EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.00	No Limit
ES1607447-003	Anonymous	EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.00	No Limit
EP074G: Trihalomethanes (QC Lot: 416168)									
ES1607425-001	BH1	EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.00	No Limit
ES1607447-003	Anonymous	EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.00	No Limit

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 Work Order : ES1607425
 Client : SULLIVAN ENVIRONMENTAL SCIENCES
 Project : SES_442



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP074H: Naphthalene (QC Lot: 416168)									
ES1607425-001	BH1	EP074: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
ES1607447-003	Anonymous	EP074: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 416167)									
ES1607425-001	BH1	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
ES1607447-003	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 416167)									
ES1607425-001	BH1	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
ES1607447-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 416167)									
ES1607425-001	BH1	EP080: Benzene	71-43-2	1	µg/L	<1	<1	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	2	µg/L	<2	<2	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
ES1607447-003	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	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	2	µg/L	<2	<2	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

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.

Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) LowHigh	
Result				
<0.001	0.1 mg/L	101	85	114
<0.0001	0.1 mg/L	97.8	84	110
<0.001	0.1 mg/L	104	85	111
<0.001	0.1 mg/L	94.7	81	111
<0.001	0.1 mg/L	88.4	83	111
<0.001	0.1 mg/L	94.1	82	112
<0.005	0.1 mg/L	108	81	117
<0.0001	0.01 mg/L	94.0	83	105
<5	10 µg/L	85.1	74	116
<5	10 µg/L	85.1	74	116
<5	10 µg/L	88.8	76	118
<5	10 µg/L	86.8	65	123
<5	10 µg/L	86.1	69	119
<5	10 µg/L	85.9	71	119
<5	10 µg/L	89.0	73	119
<5	10 µg/L	81.4	73	119
<5	10 µg/L	85.4	72	116
<50	100 µg/L	84.0	74	130
<50	100 µg/L	89.9	65	137
<50	100 µg/L	90.3	66	132
<50	100 µg/L	119	61	134
<5	10 µg/L	88.4	73	127
<5	10 µg/L	92.0	69	117
<5	10 µg/L	92.3	76	118
<5	10 µg/L	90.8	68	122
<5	10 µg/L	77.0	62	120
<5	10 µg/L	77.2	60	114

Method Blank (MB) Report

Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
	LCS	Low	High

Method: Compound	CAS Number	LOR	Unit	Result	Concentration	Epi-Isomer (%)	Recovery Rate (%)	Low	High
EP074E: Halogenated Aliphatic Compounds (QCLot: 416168) - continued									
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	10 µg/L	80.9		66	114
EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	88.0		67	119
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	10 µg/L	91.7		70	124
EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	10 µg/L	98.0		72	126
EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	109		74	120
EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	10 µg/L	97.2		70	124
EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	10 µg/L	89.4		73	119
EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	10 µg/L	98.7		74	126
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	82.4		66	136
EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	10 µg/L	97.1		73	123
EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	10 µg/L	97.2		71	129
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	128		56	140
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	10 µg/L	82.3		62	120
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	116		61	139
EP074: Chloromethane	74-87-3	50	µg/L	<50	100 µg/L	114		67	130
EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	10 µg/L	93.1		77	119
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	10 µg/L	87.2		71	128
EP074: Dibromomethane	74-95-3	5	µg/L	<5	10 µg/L	92.8		73	119
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	100 µg/L	110		61	138
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	89.4		58	130
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	70.4		70	128
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	73.5		72	126
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	10 µg/L	94.7		72	124
EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	93.1		74	118
EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	10 µg/L	87.1		60	120
EP074: Trichloroethene	79-01-6	5	µg/L	<5	10 µg/L	94.6		76	118
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	100 µg/L	106		69	131
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	100 µg/L	114		69	129
EP074F: Halogenated Aromatic Compounds (QCLot: 416168)									
EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	90.7		67	123
EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	84.1		61	125
EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	94.5		75	117
EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	92.7		75	117
EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	93.2		74	118
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	92.4		73	119
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	90.0		73	119
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	91.8		76	116
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	95.3		79	117
EP074G: Trihalomethanes (QCLot: 416168)									



Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP074G: Trihalomethanes (QCLot: 416168) - continued								
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	77.5	64	118
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	76.1	74	126
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	94.1	72	120
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	74.8	65	115
EP074H: Naphthalene (QCLot: 416168)								
EP074: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	93.6	72	122
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 416513)								
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	74.7	62	113
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	77.8	64	114
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	74.5	64	116
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	71.6	64	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	78.6	63	117
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	62.0	62	119
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	89.0	59	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	64.1	63	115
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	76.0	63	116
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	88.2	61	117
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	80.8	64	118
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	81.8	64	115
EP075(SIM): Indeno(1,2,3-cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	83.7	60	118
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	66.1	50	94
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	77.4	63	116
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	82.0	63	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 416167)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	104	75	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 416512)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	103	76	116
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	96.4	83	109
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	102	75	113
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 416167)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	108	75	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 416512)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	2500 µg/L	99.9	76	114
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	102	81	111
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1500 µg/L	97.4	77	119
EP080: BTEXN (QCLot: 416167)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	102	70	122



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result			LCS	Low
EP080: BTEXN (QCLot: 416167) - continued								
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	93.6	70	120
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	91.8	69	121
	106-42-3							
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	107	70	120
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	97.9	72	122
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	97.6	69	123

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: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 417055)							
ES1607406-012	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	101	70	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	103	70	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	86.2	70	130
		EG020A-F: Copper	7440-50-8	1 mg/L	94.8	70	130
		EG020A-F: Lead	7439-92-1	1 mg/L	94.7	70	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	98.8	70	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	107	70	130
EG035F: Dissolved Mercury by FIMS (QCLot: 417057)							
ES1607406-022	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	83.8	70	130
EP074E: Halogenated Aliphatic Compounds (QCLot: 416168)							
ES1607425-001	BH1	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	103	70	130
		EP074: Trichloroethene	79-01-6	25 µg/L	95.3	70	130
EP074F: Halogenated Aromatic Compounds (QCLot: 416168)							
ES1607425-001	BH1	EP074: Chlorobenzene	108-90-7	25 µg/L	99.3	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 416167)							
ES1607425-001	BH1	EP080: C6 - C9 Fraction	----	325 µg/L	102	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 416167)							
ES1607425-001	BH1	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	103	70	130
EP080: BTEXN (QCLot: 416167)							
ES1607425-001	BH1	EP080: Benzene	71-43-2	25 µg/L	91.1	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	92.7	70	130



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080: BTEXN (QCLot: 416167) - continued							
ES1607425-001	BH1	EP080: meta- & para-Xylene	108-38-3	25 µg/L	91.6	70	130
			106-42-3				
		EP080: Naphthalene	91-20-3	25 µg/L	103	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	96.0	70	130
		EP080: Toluene	108-88-3	25 µg/L	88.1	70	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES1607425	Page	: 1 of 5
Client	: SULLIVAN ENVIRONMENTAL SCIENCES	Laboratory	: Environmental Division Sydney
Contact	: ADAM SULLIVAN	Telephone	: +61-2-8784 8555
Project	: SES_442	Date Samples Received	: 06-Apr-2016
Site	: ----	Issue Date	: 12-Apr-2016
Sampler	: ADAM SULLIVAN	No. of samples received	: 6
Order number	: ----	No. of samples analysed	: 6

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

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



Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	11	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	13	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	11	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	13	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: **WATER**

Evaluation: **x** = Holding time breach ; **✓** = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		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) BH1, BH4, QA, BH5, BH6	05-Apr-2016	----	----	----	07-Apr-2016	02-Oct-2016	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) BH1, BH4, QA, BH5, BH6	05-Apr-2016	----	----	----	11-Apr-2016	03-May-2016	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) BH1, BH4, QA, BH5, BH6	05-Apr-2016	07-Apr-2016	12-Apr-2016	✓	08-Apr-2016	17-May-2016	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP074) BH1, BH4, QA, BH5, BH6	05-Apr-2016	07-Apr-2016	19-Apr-2016	✓	07-Apr-2016	19-Apr-2016	✓

Page : 3 of 5
 Work Order : ES1607425
 Client : SULLIVAN ENVIRONMENTAL SCIENCES
 Project : SES_442



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Amber Glass Bottle - Unpreserved (EP075(SIM))		05-Apr-2016	07-Apr-2016	12-Apr-2016	✔	08-Apr-2016	17-May-2016	✔
BH1,	BH4,							
QA,	BH5,							
BH6								
EP080: BTEXN								
Amber VOC Vial - Sulfuric Acid (EP080)		05-Apr-2016	07-Apr-2016	19-Apr-2016	✔	07-Apr-2016	19-Apr-2016	✔
TB								
EP080/071: Total Petroleum Hydrocarbons								
Amber VOC Vial - Sulfuric Acid (EP080)								
BH1,	BH4,	05-Apr-2016	07-Apr-2016	19-Apr-2016	✔	07-Apr-2016	19-Apr-2016	✔
QA,	BH5,							
BH6								



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: **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	2	10	20.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	11	0.00	10.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	13	0.00	10.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	11	0.00	5.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	13	0.00	5.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	19	5.26	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
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 (SnCl ₂)(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 SnCl ₂ 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)
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)
Volatile Organic Compounds	EP074	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. This method is compliant with 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
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.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ES1607425

Client : SULLIVAN ENVIRONMENTAL SCIENCES Contact : ADAM SULLIVAN Address : PO Box 5248 TURRAMURRA NSW 2074 E-mail : adam@sullivan-es.com.au Telephone : ---- Facsimile : ---- Project : SES_442 Order number : ---- C-O-C number : ---- Site : ---- Sampler : ADAM SULLIVAN	Laboratory : Environmental Division Sydney Contact : Address : 277-289 Woodpark Road Smithfield NSW Australia 2164 E-mail : Telephone : +61-2-8784 8555 Facsimile : +61-2-8784 8500 Page : 1 of 2 Quote number : ES2015SULENV0034 (SYBQ-207-15) QC Level : NEPM 2013 B3 & ALS QC Standard
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Dates

Date Samples Received : 06-Apr-2016 2:00 PM Client Requested Due Date : 12-Apr-2016	Issue Date : 06-Apr-2016 Scheduled Reporting Date : 12-Apr-2016
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Delivery Details

Mode of Delivery : Undefined No. of coolers/boxes : 1 Receipt Detail :	Security Seal : Intact. Temperature : 1.2' C - Ice present No. of samples received / analysed : 6 / 6
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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
- **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.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- 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: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EP074 (water) Volatile Organic Compounds	WATER - EP080 BTEXN	WATER - W-26 TRH/BTEXN/PAH/8 Metals
ES1607425-001	[05-Apr-2016]	BH1	✓		✓
ES1607425-002	[05-Apr-2016]	BH4	✓		✓
ES1607425-003	[05-Apr-2016]	QA	✓		✓
ES1607425-004	[05-Apr-2016]	BH5	✓		✓
ES1607425-005	[05-Apr-2016]	BH6	✓		✓
ES1607425-006	[05-Apr-2016]	TB		✓	

Proactive Holding Time Report

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

Requested Deliverables

ADAM SULLIVAN

- *AU Certificate of Analysis - NATA (COA)	Email	adam@sullivan-es.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	adam@sullivan-es.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	adam@sullivan-es.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	adam@sullivan-es.com.au
- A4 - AU Tax Invoice (INV)	Email	adam@sullivan-es.com.au
- Chain of Custody (CoC) (COC)	Email	adam@sullivan-es.com.au
- EDI Format - XTab (XTAB)	Email	adam@sullivan-es.com.au

CERTIFICATE OF ANALYSIS

Work Order	: ES1607425	Page	: 1 of 13
Amendment	: 1		
Client	: SULLIVAN ENVIRONMENTAL SCIENCES	Laboratory	: Environmental Division Sydney
Contact	: ADAM SULLIVAN	Contact	:
Address	: PO Box 5248 TURRAMURRA NSW 2074	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: SES_442	Date Samples Received	: 06-Apr-2016 14:00
Order number	: ----	Date Analysis Commenced	: 07-Apr-2016
C-O-C number	: ----	Issue Date	: 18-Apr-2016 13:09
Sampler	: ADAM SULLIVAN		
Site	: ----		
Quote number	: ----		
No. of samples received	: 6		
No. of samples analysed	: 6		

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 Certificate of Analysis contains the following information:

- General Comments
- Analytical 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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, 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.

- This report has been amended and re-released to allow the reporting of additional analytical data, silica gel TPH requested for samples BH5 and BH6.
- 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: WATER
 (Matrix: WATER)

Client sample ID

				BH1	BH4	QA	BH5	BH6
Client sampling date / time				[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]
Compound	CAS Number	LOR	Unit	ES1607425-001	ES1607425-002	ES1607425-003	ES1607425-004	ES1607425-005
				Result	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	<0.001
Cadmium	7440-43-9	0.0001	mg/L	0.0576	0.0004	0.0004	0.0010	0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.026	0.002	0.002	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L	0.182	0.057	0.060	0.316	0.010
Zinc	7440-66-6	0.005	mg/L	0.397	0.114	0.117	0.872	0.014
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup								
C10 - C14 Fraction	----	50	µg/L	----	----	----	<50	<50
C15 - C28 Fraction	----	100	µg/L	----	----	----	860	680
C29 - C36 Fraction	----	50	µg/L	----	----	----	510	420
C10 - C36 Fraction (sum)	----	50	µg/L	----	----	----	1370	1100
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup								
>C10 - C16 Fraction	----	100	µg/L	----	----	----	<100	<100
>C16 - C34 Fraction	----	100	µg/L	----	----	----	1070	860
>C34 - C40 Fraction	----	100	µg/L	----	----	----	510	420
>C10 - C40 Fraction (sum)	----	100	µg/L	----	----	----	1580	1280
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	5	µg/L	<5	<5	<5	<5	<5
Isopropylbenzene	98-82-8	5	µg/L	<5	<5	<5	<5	<5
n-Propylbenzene	103-65-1	5	µg/L	<5	<5	<5	<5	<5
1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	<5	<5	<5
sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	<5	<5	<5
1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	<5	<5	<5
tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	<5	<5	<5
p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	<5	<5	<5
n-Butylbenzene	104-51-8	5	µg/L	<5	<5	<5	<5	<5
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	50	µg/L	<50	<50	<50	<50	<50
2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	<50	<50	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	<50	<50	<50
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	<50	<50	<50



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				BH1	BH4	QA	BH5	BH6
Client sampling date / time				[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]
Compound	CAS Number	LOR	Unit	ES1607425-001	ES1607425-002	ES1607425-003	ES1607425-004	ES1607425-005
				Result	Result	Result	Result	Result
EP074C: Sulfonated Compounds								
Carbon disulfide	75-15-0	5	µg/L	<5	<5	<5	<5	<5
EP074D: Fumigants								
2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	<5	<5	<5
1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	<5	<5	<5
cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	<5	<5	<5
trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	<5	<5	<5
1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	<5	<5	<5
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	<50	<50	<50
Chloromethane	74-87-3	50	µg/L	<50	<50	<50	<50	<50
Vinyl chloride	75-01-4	50	µg/L	<50	<50	<50	<50	<50
Bromomethane	74-83-9	50	µg/L	<50	<50	<50	<50	<50
Chloroethane	75-00-3	50	µg/L	<50	<50	<50	<50	<50
Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	<50	<50	<50
1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	<5	<5	<5
Iodomethane	74-88-4	5	µg/L	<5	<5	<5	<5	<5
trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	<5	<5	<5
1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	<5	<5	<5
cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	<5	<5	<5
1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	<5	<5	<5
1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	<5	<5	<5
Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	<5	<5	<5
1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	<5	<5	<5
Trichloroethene	79-01-6	5	µg/L	<5	<5	<5	<5	<5
Dibromomethane	74-95-3	5	µg/L	<5	<5	<5	<5	<5
1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	<5	<5	<5
1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	<5	<5	<5
Tetrachloroethene	127-18-4	5	µg/L	<5	<5	<5	<5	<5
1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	<5	<5	<5
trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	<5	<5	<5
cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	<5	<5	<5
1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	<5	<5	<5	<5
Pentachloroethane	76-01-7	5	µg/L	<5	<5	<5	<5	<5



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Client sample ID

				BH1	BH4	QA	BH5	BH6
Client sampling date / time				[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]
Compound	CAS Number	LOR	Unit	ES1607425-001	ES1607425-002	ES1607425-003	ES1607425-004	ES1607425-005
				Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued								
1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	<5	<5	<5
Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	<5	<5	<5
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	5	µg/L	<5	<5	<5	<5	<5
Bromobenzene	108-86-1	5	µg/L	<5	<5	<5	<5	<5
2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	<5	<5	<5
4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	<5	<5	<5
1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	<5	<5	<5
1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	<5	<5	<5
1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	<5	<5	<5
1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	<5	<5	<5
1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	<5	<5	<5
EP074G: Trihalomethanes								
Chloroform	67-66-3	5	µg/L	<5	<5	<5	<5	9
Bromodichloromethane	75-27-4	5	µg/L	<5	<5	<5	<5	<5
Dibromochloromethane	124-48-1	5	µg/L	<5	<5	<5	<5	<5
Bromoform	75-25-2	5	µg/L	<5	<5	<5	<5	<5
EP074H: Naphthalene								
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	1.8
Anthracene	120-12-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L	<1.0	<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	<1.0
Chrysene	218-01-9	1	µg/L	<1.0	<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	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	<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	<0.5
Indeno(1,2,3.cd)pyrene	193-39-5	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID		BH1		BH4		QA		BH5		BH6	
Client sampling date / time				[05-Apr-2016]		[05-Apr-2016]		[05-Apr-2016]		[05-Apr-2016]		[05-Apr-2016]		[05-Apr-2016]	
Compound	CAS Number	LOR	Unit	ES1607425-001		ES1607425-002		ES1607425-003		ES1607425-004		ES1607425-005			
				Result		Result		Result		Result		Result			
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued															
Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0		<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		<1.0			
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5		<0.5		<0.5		<0.5		1.8			
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5		<0.5		<0.5		<0.5		<0.5			
EP080/071: Total Petroleum Hydrocarbons															
C6 - C9 Fraction	----	20	µg/L	<20		<20		<20		<20		<20			
C10 - C14 Fraction	----	50	µg/L	<50		<50		<50		120		160			
C15 - C28 Fraction	----	100	µg/L	<100		<100		<100		1320		1030			
C29 - C36 Fraction	----	50	µg/L	<50		<50		<50		620		470			
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50		<50		<50		2060		1660			
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions															
C6 - C10 Fraction	C6_C10	20	µg/L	<20		<20		<20		<20		<20			
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20		<20		<20		<20		<20			
>C10 - C16 Fraction	----	100	µg/L	<100		<100		<100		210		220			
>C16 - C34 Fraction	----	100	µg/L	<100		<100		<100		1540		1190			
>C34 - C40 Fraction	----	100	µg/L	<100		<100		<100		420		310			
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100		<100		<100		2170		1720			
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100		<100		<100		210		220			
EP080: BTEXN															
Benzene	71-43-2	1	µg/L	<1		<1		<1		<1		<1			
Toluene	108-88-3	2	µg/L	<2		<2		<2		4		4			
Ethylbenzene	100-41-4	2	µg/L	<2		<2		<2		<2		<2			
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2		<2		<2		<2		<2			
ortho-Xylene	95-47-6	2	µg/L	<2		<2		<2		<2		<2			
^ Total Xylenes	1330-20-7	2	µg/L	<2		<2		<2		<2		<2			
^ Sum of BTEX	----	1	µg/L	<1		<1		<1		4		4			
Naphthalene	91-20-3	5	µg/L	<5		<5		<5		<5		<5			
EP074S: VOC Surrogates															
1,2-Dichloroethane-D4	17060-07-0	5	%	120		118		120		124		118			
Toluene-D8	2037-26-5	5	%	117		118		119		122		117			
4-Bromofluorobenzene	460-00-4	5	%	103		104		102		104		101			
EP075(SIM)S: Phenolic Compound Surrogates															



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Client sample ID

				BH1	BH4	QA	BH5	BH6
Client sampling date / time				[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]
Compound	CAS Number	LOR	Unit	ES1607425-001	ES1607425-002	ES1607425-003	ES1607425-004	ES1607425-005
				Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates - Continued								
Phenol-d6	13127-88-3	1	%	34.5	27.4	18.5	33.4	36.2
2-Chlorophenol-D4	93951-73-6	1	%	71.5	61.7	48.2	67.4	52.2
2,4,6-Tribromophenol	118-79-6	1	%	58.5	67.0	62.0	71.7	54.4
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	67.7	66.2	66.8	88.1	50.5
Anthracene-d10	1719-06-8	1	%	98.8	85.4	87.9	91.8	76.0
4-Terphenyl-d14	1718-51-0	1	%	72.7	77.3	69.4	71.8	73.8
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	2	%	113	111	114	117	111
Toluene-D8	2037-26-5	2	%	112	112	114	117	112
4-Bromofluorobenzene	460-00-4	2	%	107	107	106	108	105



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Client sample ID

				TB	----	----	----	----
Client sampling date / time				[05-Apr-2016]	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1607425-006	-----	-----	-----	-----
				Result	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	----	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	----	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	----	----	----	----	----
Copper	7440-50-8	0.001	mg/L	----	----	----	----	----
Lead	7439-92-1	0.001	mg/L	----	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	----	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	----	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	----	----	----	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup								
C10 - C14 Fraction	----	50	µg/L	----	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	----	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	----	----	----	----	----
C10 - C36 Fraction (sum)	----	50	µg/L	----	----	----	----	----
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup								
>C10 - C16 Fraction	----	100	µg/L	----	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	----	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	----	----	----	----	----
>C10 - C40 Fraction (sum)	----	100	µg/L	----	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	5	µg/L	----	----	----	----	----
Isopropylbenzene	98-82-8	5	µg/L	----	----	----	----	----
n-Propylbenzene	103-65-1	5	µg/L	----	----	----	----	----
1,3,5-Trimethylbenzene	108-67-8	5	µg/L	----	----	----	----	----
sec-Butylbenzene	135-98-8	5	µg/L	----	----	----	----	----
1,2,4-Trimethylbenzene	95-63-6	5	µg/L	----	----	----	----	----
tert-Butylbenzene	98-06-6	5	µg/L	----	----	----	----	----
p-Isopropyltoluene	99-87-6	5	µg/L	----	----	----	----	----
n-Butylbenzene	104-51-8	5	µg/L	----	----	----	----	----
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	50	µg/L	----	----	----	----	----
2-Butanone (MEK)	78-93-3	50	µg/L	----	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	----	----	----	----	----
2-Hexanone (MBK)	591-78-6	50	µg/L	----	----	----	----	----



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Client sample ID

				TB	----	----	----	----
Client sampling date / time				[05-Apr-2016]	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1607425-006	-----	-----	-----	-----
				Result	----	----	----	----
EP074C: Sulfonated Compounds								
Carbon disulfide	75-15-0	5	µg/L	----	----	----	----	----
EP074D: Fumigants								
2,2-Dichloropropane	594-20-7	5	µg/L	----	----	----	----	----
1,2-Dichloropropane	78-87-5	5	µg/L	----	----	----	----	----
cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	----	----	----	----	----
trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	----	----	----	----	----
1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	----	----	----	----	----
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	50	µg/L	----	----	----	----	----
Chloromethane	74-87-3	50	µg/L	----	----	----	----	----
Vinyl chloride	75-01-4	50	µg/L	----	----	----	----	----
Bromomethane	74-83-9	50	µg/L	----	----	----	----	----
Chloroethane	75-00-3	50	µg/L	----	----	----	----	----
Trichlorofluoromethane	75-69-4	50	µg/L	----	----	----	----	----
1,1-Dichloroethene	75-35-4	5	µg/L	----	----	----	----	----
Iodomethane	74-88-4	5	µg/L	----	----	----	----	----
trans-1,2-Dichloroethene	156-60-5	5	µg/L	----	----	----	----	----
1,1-Dichloroethane	75-34-3	5	µg/L	----	----	----	----	----
cis-1,2-Dichloroethene	156-59-2	5	µg/L	----	----	----	----	----
1,1,1-Trichloroethane	71-55-6	5	µg/L	----	----	----	----	----
1,1-Dichloropropylene	563-58-6	5	µg/L	----	----	----	----	----
Carbon Tetrachloride	56-23-5	5	µg/L	----	----	----	----	----
1,2-Dichloroethane	107-06-2	5	µg/L	----	----	----	----	----
Trichloroethene	79-01-6	5	µg/L	----	----	----	----	----
Dibromomethane	74-95-3	5	µg/L	----	----	----	----	----
1,1,2-Trichloroethane	79-00-5	5	µg/L	----	----	----	----	----
1,3-Dichloropropane	142-28-9	5	µg/L	----	----	----	----	----
Tetrachloroethene	127-18-4	5	µg/L	----	----	----	----	----
1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	----	----	----	----	----
trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	----	----	----	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	----	----	----	----	----
1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	----	----	----	----	----
1,2,3-Trichloropropane	96-18-4	5	µg/L	----	----	----	----	----
Pentachloroethane	76-01-7	5	µg/L	----	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TB	----	----	----	----
Client sampling date / time					[05-Apr-2016]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1607425-006	-----	-----	-----	-----
					Result	----	----	----	----
EP074E: Halogenated Aliphatic Compounds - Continued									
1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L		----	----	----	----	----
Hexachlorobutadiene	87-68-3	5	µg/L		----	----	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		----	----	----	----	----
Bromobenzene	108-86-1	5	µg/L		----	----	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L		----	----	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L		----	----	----	----	----
1,3-Dichlorobenzene	541-73-1	5	µg/L		----	----	----	----	----
1,4-Dichlorobenzene	106-46-7	5	µg/L		----	----	----	----	----
1,2-Dichlorobenzene	95-50-1	5	µg/L		----	----	----	----	----
1,2,4-Trichlorobenzene	120-82-1	5	µg/L		----	----	----	----	----
1,2,3-Trichlorobenzene	87-61-6	5	µg/L		----	----	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		----	----	----	----	----
Bromodichloromethane	75-27-4	5	µg/L		----	----	----	----	----
Dibromochloromethane	124-48-1	5	µg/L		----	----	----	----	----
Bromoform	75-25-2	5	µg/L		----	----	----	----	----
EP074H: Naphthalene									
Naphthalene	91-20-3	5	µg/L		----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		----	----	----	----	----
Acenaphthylene	208-96-8	1	µg/L		----	----	----	----	----
Acenaphthene	83-32-9	1	µg/L		----	----	----	----	----
Fluorene	86-73-7	1	µg/L		----	----	----	----	----
Phenanthrene	85-01-8	1	µg/L		----	----	----	----	----
Anthracene	120-12-7	1	µg/L		----	----	----	----	----
Fluoranthene	206-44-0	1	µg/L		----	----	----	----	----
Pyrene	129-00-0	1	µg/L		----	----	----	----	----
Benz(a)anthracene	56-55-3	1	µg/L		----	----	----	----	----
Chrysene	218-01-9	1	µg/L		----	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L		----	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		----	----	----	----	----

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TB	----	----	----	----
Client sampling date / time				[05-Apr-2016]	----	----	----	----	
Compound	CAS Number	LOR	Unit	ES1607425-006	-----	-----	-----	-----	
				Result	----	----	----	----	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Dibenz(a,h)anthracene	53-70-3	1	µg/L	----	----	----	----	----	
Benzo(g,h,i)perylene	191-24-2	1	µg/L	----	----	----	----	----	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	----	----	----	----	----	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	----	----	----	----	----	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L	----	----	----	----	----	
C10 - C14 Fraction	----	50	µg/L	----	----	----	----	----	
C15 - C28 Fraction	----	100	µg/L	----	----	----	----	----	
C29 - C36 Fraction	----	50	µg/L	----	----	----	----	----	
^ C10 - C36 Fraction (sum)	----	50	µg/L	----	----	----	----	----	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L	----	----	----	----	----	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	----	----	----	----	----	
>C10 - C16 Fraction	----	100	µg/L	----	----	----	----	----	
>C16 - C34 Fraction	----	100	µg/L	----	----	----	----	----	
>C34 - C40 Fraction	----	100	µg/L	----	----	----	----	----	
^ >C10 - C40 Fraction (sum)	----	100	µg/L	----	----	----	----	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	----	----	----	----	----	
EP080: BTEXN									
Benzene	71-43-2	1	µg/L	<1	----	----	----	----	
Toluene	108-88-3	2	µg/L	<2	----	----	----	----	
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----	
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----	
^ Total Xylenes	1330-20-7	2	µg/L	<2	----	----	----	----	
^ Sum of BTEX	----	1	µg/L	<1	----	----	----	----	
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----	
EP074S: VOC Surrogates									
1,2-Dichloroethane-D4	17060-07-0	5	%	----	----	----	----	----	
Toluene-D8	2037-26-5	5	%	----	----	----	----	----	
4-Bromofluorobenzene	460-00-4	5	%	----	----	----	----	----	
EP075(SIM)S: Phenolic Compound Surrogates									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TB	----	----	----	----
Client sampling date / time					[05-Apr-2016]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1607425-006	-----	-----	-----	-----
				Result	----	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
Phenol-d6	13127-88-3	1	%		----	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%		----	----	----	----	----
2,4,6-Tribromophenol	118-79-6	1	%		----	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		----	----	----	----	----
Anthracene-d10	1719-06-8	1	%		----	----	----	----	----
4-Terphenyl-d14	1718-51-0	1	%		----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%		116	----	----	----	----
Toluene-D8	2037-26-5	2	%		117	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		109	----	----	----	----



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP074S: VOC Surrogates			
1,2-Dichloroethane-D4	17060-07-0	78	133
Toluene-D8	2037-26-5	79	129
4-Bromofluorobenzene	460-00-4	81	124
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 : **ES1607425**

Page : 1 of 11

Amendment : **1**

Client : **SULLIVAN ENVIRONMENTAL SCIENCES**

Laboratory : Environmental Division Sydney

Contact : ADAM SULLIVAN

Contact :

Address : PO Box 5248
TURRAMURRA NSW 2074

Address : 277-289 Woodpark Road Smithfield NSW Australia 2164

Telephone : ----

Telephone : +61-2-8784 8555

Project : SES_442

Date Samples Received : 06-Apr-2016

Order number : ----

Date Analysis Commenced : 07-Apr-2016

C-O-C number : ----

Issue Date : 18-Apr-2016

Sampler : ADAM SULLIVAN

Site : ----

Quote number : ----

No. of samples received : 6

No. of samples analysed : 6

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

Celine Conceicao

Senior Spectroscopist

Sydney Inorganics, Smithfield, NSW

Edwandy Fadjar

Organic Coordinator

Sydney Organics, Smithfield, 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: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 417055)									
ES1607425-003	QA	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0004	0.0004	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	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	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	0.060	0.053	11.8	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.117	0.109	7.12	0% - 20%
ES1607406-013	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0010	<0.0010	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.010	<0.010	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.010	<0.010	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.010	<0.010	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.010	<0.010	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.010	<0.010	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.050	<0.050	0.00	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 417057)									
ES1607406-023	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
ES1607427-002	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 416168)									
ES1607425-001	BH1	EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 416168) - continued									
ES1607425-001	BH1	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.00	No Limit
ES1607447-003	Anonymous	EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.00	No Limit
EP074B: Oxygenated Compounds (QC Lot: 416168)									
ES1607425-001	BH1	EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.00	No Limit
		EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.00	No Limit
ES1607447-003	Anonymous	EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.00	No Limit
		EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.00	No Limit
EP074C: Sulfonated Compounds (QC Lot: 416168)									
ES1607425-001	BH1	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.00	No Limit
ES1607447-003	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.00	No Limit
EP074D: Fumigants (QC Lot: 416168)									
ES1607425-001	BH1	EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.00	No Limit
ES1607447-003	Anonymous	EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.00	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 416168)									
ES1607425-001	BH1	EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.00	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP074E: Halogenated Aliphatic Compounds (QC Lot: 416168) - continued									
ES1607425-001	BH1	EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.00	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.00	No Limit
ES1607447-003	Anonymous	EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP074E: Halogenated Aliphatic Compounds (QC Lot: 416168) - continued									
ES1607447-003	Anonymous	EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.00	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.00	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 416168)									
ES1607425-001	BH1	EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.00	No Limit
ES1607447-003	Anonymous	EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.00	No Limit
EP074G: Trihalomethanes (QC Lot: 416168)									
ES1607425-001	BH1	EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.00	No Limit
ES1607447-003	Anonymous	EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.00	No Limit

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 Work Order : ES1607425 Amendment 1
 Client : SULLIVAN ENVIRONMENTAL SCIENCES
 Project : SES_442



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP074H: Naphthalene (QC Lot: 416168)									
ES1607425-001	BH1	EP074: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
ES1607447-003	Anonymous	EP074: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 416167)									
ES1607425-001	BH1	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
ES1607447-003	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 416167)									
ES1607425-001	BH1	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
ES1607447-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 416167)									
ES1607425-001	BH1	EP080: Benzene	71-43-2	1	µg/L	<1	<1	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	2	µg/L	<2	<2	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
ES1607447-003	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	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	2	µg/L	<2	<2	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	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: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 417055)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	101	85	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	97.8	84	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	104	85	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	94.7	81	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	88.4	83	111
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	94.1	82	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	108	81	117
EG035F: Dissolved Mercury by FIMS (QCLot: 417057)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	94.0	83	105
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup (QCLot: 423298)								
EP071-SVSG: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	103	57	137
EP071-SVSG: C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
EP071-SVSG: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	101	77	135
EP071-SVSG: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	99.1	62	130
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup (QCLot: 423298)								
EP071-SVSG: >C10 - C16 Fraction	----	100	µg/L	<100	2500 µg/L	103	57	137
EP071-SVSG: >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	----	----
EP071-SVSG: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	100	65	123
EP071-SVSG: >C34 - C40 Fraction	----	100	µg/L	<100	1500 µg/L	98.5	60	130
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 416168)								
EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	10 µg/L	85.1	74	116
EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	10 µg/L	85.1	74	116
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	10 µg/L	88.8	76	118
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	10 µg/L	86.8	65	123
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	10 µg/L	86.1	69	119
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	10 µg/L	85.9	71	119
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	10 µg/L	89.0	73	119
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	81.4	73	119
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	10 µg/L	85.4	72	116
EP074B: Oxygenated Compounds (QCLot: 416168)								
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	100 µg/L	84.0	74	130
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	100 µg/L	89.9	65	137
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	100 µg/L	90.3	66	132
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	100 µg/L	119	61	134



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP074C: Sulfonated Compounds (QCLot: 416168)								
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	10 µg/L	88.4	73	127
EP074D: Fumigants (QCLot: 416168)								
EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	10 µg/L	92.0	69	117
EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	10 µg/L	92.3	76	118
EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	10 µg/L	90.8	68	122
EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	10 µg/L	77.0	62	120
EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	10 µg/L	77.2	60	114
EP074E: Halogenated Aliphatic Compounds (QCLot: 416168)								
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	10 µg/L	80.9	66	114
EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	88.0	67	119
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	10 µg/L	91.7	70	124
EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	10 µg/L	98.0	72	126
EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	109	74	120
EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	10 µg/L	97.2	70	124
EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	10 µg/L	89.4	73	119
EP074: 1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	10 µg/L	98.7	74	126
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	82.4	66	136
EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	10 µg/L	97.1	73	123
EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	10 µg/L	97.2	71	129
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	128	56	140
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	10 µg/L	82.3	62	120
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	116	61	139
EP074: Chloromethane	74-87-3	50	µg/L	<50	100 µg/L	114	67	130
EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	10 µg/L	93.1	77	119
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	10 µg/L	87.2	71	128
EP074: Dibromomethane	74-95-3	5	µg/L	<5	10 µg/L	92.8	73	119
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	100 µg/L	110	61	138
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	89.4	58	130
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	70.4	70	128
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	73.5	72	126
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	10 µg/L	94.7	72	124
EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	93.1	74	118
EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	10 µg/L	87.1	60	120
EP074: Trichloroethene	79-01-6	5	µg/L	<5	10 µg/L	94.6	76	118
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	100 µg/L	106	69	131
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	100 µg/L	114	69	129
EP074F: Halogenated Aromatic Compounds (QCLot: 416168)								
EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	90.7	67	123



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP074F: Halogenated Aromatic Compounds (QCLot: 416168) - continued								
EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	84.1	61	125
EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	94.5	75	117
EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	92.7	75	117
EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	93.2	74	118
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	92.4	73	119
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	90.0	73	119
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	91.8	76	116
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	95.3	79	117
EP074G: Trihalomethanes (QCLot: 416168)								
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	77.5	64	118
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	76.1	74	126
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	94.1	72	120
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	74.8	65	115
EP074H: Naphthalene (QCLot: 416168)								
EP074: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	93.6	72	122
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 416513)								
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	74.7	62	113
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	77.8	64	114
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	74.5	64	116
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	71.6	64	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	78.6	63	117
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	1	µg/L	<1.0	5 µg/L	62.0	62	119
	205-82-3							
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	89.0	59	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	64.1	63	115
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	76.0	63	116
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	88.2	61	117
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	80.8	64	118
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	81.8	64	115
EP075(SIM): Indeno(1,2,3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	83.7	60	118
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	66.1	50	94
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	77.4	63	116
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	82.0	63	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 416167)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	104	75	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 416512)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	103	76	116
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	96.4	83	109

Page : 11 of 11
 Work Order : ES1607425 Amendment 1
 Client : SULLIVAN ENVIRONMENTAL SCIENCES
 Project : SES_442



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP074F: Halogenated Aromatic Compounds (QCLot: 416168) - continued							
ES1607425-001	BH1	EP074: Chlorobenzene	108-90-7	25 µg/L	99.3	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 416167)							
ES1607425-001	BH1	EP080: C6 - C9 Fraction	----	325 µg/L	102	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 416167)							
ES1607425-001	BH1	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	103	70	130
EP080: BTEXN (QCLot: 416167)							
ES1607425-001	BH1	EP080: Benzene	71-43-2	25 µg/L	91.1	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	92.7	70	130
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	91.6	70	130
			106-42-3				
		EP080: Naphthalene	91-20-3	25 µg/L	103	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	96.0	70	130
		EP080: Toluene	108-88-3	25 µg/L	88.1	70	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order : ES1607425

Page : 1 of 5

Amendment : 1

Client : SULLIVAN ENVIRONMENTAL SCIENCES

Contact : ADAM SULLIVAN

Project : SES_442

Site : ----

Sampler : ADAM SULLIVAN

Order number : ----

Laboratory : Environmental Division Sydney

Telephone : +61-2-8784 8555

Date Samples Received : 06-Apr-2016

Issue Date : 18-Apr-2016

No. of samples received : 6

No. of samples analysed : 6

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

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

Matrix: **WATER**

Analysis Holding Time Compliance

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 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: WATER

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

<i>Method</i>	<i>Sample Date</i>	<i>Extraction / Preparation</i>			<i>Analysis</i>		
<i>Container / Client Sample ID(s)</i>		<i>Date extracted</i>	<i>Due for extraction</i>	<i>Evaluation</i>	<i>Date analysed</i>	<i>Due for analysis</i>	<i>Evaluation</i>
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) BH1, QA, BH6 BH4, BH5,	05-Apr-2016	----	----	----	07-Apr-2016	02-Oct-2016	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) BH1, QA, BH6 BH4, BH5,	05-Apr-2016	----	----	----	11-Apr-2016	03-May-2016	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) BH1, QA, BH6 BH4, BH5,	05-Apr-2016	07-Apr-2016	12-Apr-2016	✓	08-Apr-2016	17-May-2016	✓
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071-SVSG) BH5, BH6	05-Apr-2016	07-Apr-2016	12-Apr-2016	✓	15-Apr-2016	17-May-2016	✓



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP074A: Monocyclic Aromatic Hydrocarbons								
Amber VOC Vial - Sulfuric Acid (EP074)		05-Apr-2016	07-Apr-2016	19-Apr-2016	✔	07-Apr-2016	19-Apr-2016	✔
BH1, QA, BH6	BH4, BH5,							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Amber Glass Bottle - Unpreserved (EP075(SIM))		05-Apr-2016	07-Apr-2016	12-Apr-2016	✔	08-Apr-2016	17-May-2016	✔
BH1, QA, BH6	BH4, BH5,							
EP080: BTEXN								
Amber VOC Vial - Sulfuric Acid (EP080)		05-Apr-2016	07-Apr-2016	19-Apr-2016	✔	07-Apr-2016	19-Apr-2016	✔
TB								
EP080/071: Total Petroleum Hydrocarbons								
Amber VOC Vial - Sulfuric Acid (EP080)		05-Apr-2016	07-Apr-2016	19-Apr-2016	✔	07-Apr-2016	19-Apr-2016	✔
BH1, QA, BH6	BH4, BH5,							



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: **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	2	10	20.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	11	0.00	10.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	13	0.00	10.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	EP071-SVSG	0	2	0.00	10.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	EP071-SVSG	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	EP071-SVSG	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	11	0.00	5.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	13	0.00	5.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	EP071-SVSG	0	2	0.00	5.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	19	5.26	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
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 (SnCl ₂)(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 SnCl ₂ 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)
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)
TRH - Semivolatile Fractions Only (after Silica Gel Cleanup)	EP071-SVSG	WATER	In house: Referenced to USEPA SW 846 - 8015A Sample extracts cleaned up using silica gel and are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	EP074	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. This method is compliant with 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
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.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ES1607425

Amendment : 1

Client : SULLIVAN ENVIRONMENTAL SCIENCES

Laboratory : Environmental Division Sydney

Contact : ADAM SULLIVAN

Contact :

**Address : PO Box 5248
TURRAMURRA NSW 2074**

**Address : 277-289 Woodpark Road Smithfield
NSW Australia 2164**

E-mail : adam@sullivan-es.com.au

E-mail :

Telephone : ---

Telephone : +61-2-8784 8555

Facsimile : ---

Facsimile : +61-2-8784 8500

Project : SES_442

Page : 1 of 2

Order number : ---

Quote number : ES2015SULENV0034 (SYBQ-207-15)

C-O-C number : ---

QC Level : NEPM 2013 B3 & ALS QC Standard

Site : ---

Sampler : ADAM SULLIVAN

Dates

Date Samples Received : 06-Apr-2016 2:00 PM

Issue Date : 13-Apr-2016

Client Requested Due Date : 12-Apr-2016

Scheduled Reporting Date : 18-Apr-2016

Delivery Details

Mode of Delivery : Undefined

Security Seal : Intact.

No. of coolers/boxes : 1

Temperature : 1.2' C - Ice present

Receipt Detail :

No. of samples received / analysed : 6 / 6

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
- **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.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- 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: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EP071-SVSG TRH - Semivolatile Fractions Only (after Silica)	WATER - EP074 (water) Volatile Organic Compounds	WATER - EP080 BTEXN	WATER - W-26 TRH/BTEXN/PAH/8 Metals
ES1607425-001	[05-Apr-2016]	BH1		✓		✓
ES1607425-002	[05-Apr-2016]	BH4		✓		✓
ES1607425-003	[05-Apr-2016]	QA		✓		✓
ES1607425-004	[05-Apr-2016]	BH5	✓	✓		✓
ES1607425-005	[05-Apr-2016]	BH6	✓	✓		✓
ES1607425-006	[05-Apr-2016]	TB			✓	

Proactive Holding Time Report

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

Requested Deliverables

ADAM SULLIVAN

- *AU Certificate of Analysis - NATA (COA)	Email	adam@sullivan-es.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	adam@sullivan-es.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	adam@sullivan-es.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	adam@sullivan-es.com.au
- A4 - AU Tax Invoice (INV)	Email	adam@sullivan-es.com.au
- Chain of Custody (CoC) (COC)	Email	adam@sullivan-es.com.au
- EDI Format - XTab (XTAB)	Email	adam@sullivan-es.com.au

#Quote

THIS COLUMN FOR LAB USE ONLY		DATE: 6/4/16		TO: ALS Environmental		Container Size, Type, Preservative and Analysis	
FROM: Sullivan Environmental Sciences		DATE: 6/4/16		TO: ALS Environmental		Container Identification	
Job Code:		PO Box 5248 Turramurra NSW 2074		SULLIVAN environmental sciences		Size Type* Preservative Code	
Due Date:		Project No: SES-442		Email: adam@sullivan-es.com.au		Analytes	
Project Manager: A. Sullivan		Signature(s):		A. Sullivan		VOC scan	
Agreement No: SYBQ/207/15		Checked:		Received by: <i>Steph</i>		BT EXN	
Released by: <i>A. Sullivan</i>		Date: 6/4/16		Time: 12pm		Total no	
Date: 6/4/16		Time: 12pm		Date: 6/4/16		Time: 1-2c	
Lab Identification		Date		Matrix		Sample Number	
1		5/4/16		Water		BH1	
2						BH4	
3						QA	
4						BH5	
5						BH6	
6						TB	
Custody seal intact?		YES		NO		Comments	
Sample cold?		YES		NO		Total no	
1		4		X		X	
2		4		X		X	
3		4		X		X	
4		4		X		X	
5		4		X		X	
6		1		X		X	
Remarks:		TOTAL		21		5	
Courier Job No:		Specify Turnaround Time:		NOTE: SAMPLES MAY CONTAIN DANGEROUS AND HAZARDOUS SUBSTANCES		Environmental Division Sydney Work Order Reference ES1607425	

CERTIFICATE OF ANALYSIS

Work Order : **ES1819892**
Client : **SULLIVAN ENVIRONMENTAL SCIENCES**
Contact : ADAM SULLIVAN
Address : PO Box 5248
 TURRAMURRA NSW 2074
Telephone : ----
Project : SES_442
Order number :
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : EN/222/17
No. of samples received : 21
No. of samples analysed : 19

Page : 1 of 17
Laboratory : Environmental Division Sydney
Contact : Customer Services ES
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 05-Jul-2018 13:30
Date Analysis Commenced : 09-Jul-2018
Issue Date : 12-Jul-2018 19:29



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Gerrad Morgan	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Ivan Taylor	Analyst	Sydney Inorganics, 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.

- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Ch' Chrysotile (white asbestos)
- EA200 'Cr' Crocidolite (blue 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.
- EG005: Poor precision was obtained for Zinc on sample ES1819838-1. Results have been confirmed by re-extraction and reanalysis.
- EG005: Poor precision was obtained for Zinc on sample ES1819891-31. Results have been confirmed by re-extraction and reanalysis.
- 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
- 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.
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB12_0.1	SB12_0.4-0.5	QC04	SB13_0.1-0.2	SB13_0.8
Client sampling date / time					04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00
Compound	CAS Number	LOR	Unit		ES1819892-001	ES1819892-002	ES1819892-003	ES1819892-004	ES1819892-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		22.3	23.7	23.6	17.5	22.6
EA200: AS 4964 - 2004 Identification of Asbestos in Soils									
Asbestos Detected	1332-21-4	0.1	g/kg		No	----	----	----	----
Asbestos (Trace)	1332-21-4	5	Fibres		No	----	----	----	----
Asbestos Type	1332-21-4	-	--		-	----	----	----	----
Sample weight (dry)	----	0.01	g		29.7	----	----	----	----
APPROVED IDENTIFIER:	----	-	--		S.SPOONER	----	----	----	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		6	6	6	9	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		26	16	19	31	27
Copper	7440-50-8	5	mg/kg		20	22	21	37	18
Lead	7439-92-1	5	mg/kg		18	18	20	176	25
Nickel	7440-02-0	2	mg/kg		3	<2	<2	10	5
Zinc	7440-66-6	5	mg/kg		6	<5	<5	261	7
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	0.1	<0.1
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
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	0.7	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	0.8	<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	0.7	<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

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID		SB12_0.1	SB12_0.4-0.5	QC04	SB13_0.1-0.2	SB13_0.8
Client sampling date / time				04-Jul-2018 00:00		04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00
Compound	CAS Number	LOR	Unit	ES1819892-001	ES1819892-002	ES1819892-003	ES1819892-004	ES1819892-005		
				Result	Result	Result	Result	Result		
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued										
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	2.7	<0.5		
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	0.6	<0.5		
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.9	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										
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	----	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		
EP075(SIM)S: Phenolic Compound Surrogates										
Phenol-d6	13127-88-3	0.5	%	71.8	75.0	78.4	71.9	74.4		
2-Chlorophenol-D4	93951-73-6	0.5	%	70.3	74.1	76.7	72.0	75.1		
2,4,6-Tribromophenol	118-79-6	0.5	%	63.5	69.9	71.5	64.1	68.5		
EP075(SIM)T: PAH Surrogates										



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB12_0.1	SB12_0.4-0.5	QC04	SB13_0.1-0.2	SB13_0.8
Client sampling date / time					04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00
Compound	CAS Number	LOR	Unit		ES1819892-001	ES1819892-002	ES1819892-003	ES1819892-004	ES1819892-005
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued									
2-Fluorobiphenyl	321-60-8	0.5	%		77.1	79.7	82.1	77.7	79.8
Anthracene-d10	1719-06-8	0.5	%		81.8	87.6	87.8	81.5	87.0
4-Terphenyl-d14	1718-51-0	0.5	%		82.4	86.6	88.7	81.9	85.6
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		85.7	76.5	85.4	88.0	94.7
Toluene-D8	2037-26-5	0.2	%		82.1	77.8	85.9	83.5	102
4-Bromofluorobenzene	460-00-4	0.2	%		83.7	77.5	83.5	82.7	97.8



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB14_0.1	SB14_0.4	SB14_0.8	SB15_0.1-0.2	SB16_0.2-0.3
Client sampling date / time					04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00
Compound	CAS Number	LOR	Unit		ES1819892-006	ES1819892-007	ES1819892-008	ES1819892-009	ES1819892-011
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		----	15.1	23.4	24.0	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils									
Asbestos Detected	1332-21-4	0.1	g/kg		No	----	----	No	No
Asbestos (Trace)	1332-21-4	5	Fibres		No	----	----	No	No
Asbestos Type	1332-21-4	-	--		-	----	----	-	-
Sample weight (dry)	----	0.01	g		31.1	----	----	41.1	27.6
APPROVED IDENTIFIER:	----	-	--		S.SPOONER	----	----	S.SPOONER	S.SPOONER
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		----	<5	9	<5	----
Cadmium	7440-43-9	1	mg/kg		----	<1	<1	<1	----
Chromium	7440-47-3	2	mg/kg		----	13	19	5	----
Copper	7440-50-8	5	mg/kg		----	14	19	50	----
Lead	7439-92-1	5	mg/kg		----	20	21	36	----
Nickel	7440-02-0	2	mg/kg		----	5	<2	5	----
Zinc	7440-66-6	5	mg/kg		----	41	<5	95	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		----	<0.1	<0.1	0.2	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		----	<0.5	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg		----	<0.5	<0.5	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg		----	<0.5	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg		----	<0.5	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg		----	<0.5	<0.5	<0.5	----
Anthracene	120-12-7	0.5	mg/kg		----	<0.5	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg		----	<0.5	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg		----	<0.5	<0.5	<0.5	----
Benzo(a)anthracene	56-55-3	0.5	mg/kg		----	<0.5	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg		----	<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	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		----	<0.5	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	<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	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		----	<0.5	<0.5	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		----	<0.5	<0.5	<0.5	----

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB14_0.1	SB14_0.4	SB14_0.8	SB15_0.1-0.2	SB16_0.2-0.3
Client sampling date / time				04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00	
Compound	CAS Number	LOR	Unit	ES1819892-006	ES1819892-007	ES1819892-008	ES1819892-009	ES1819892-011	
				Result	Result	Result	Result	Result	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	<0.5	<0.5	<0.5	----	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	<0.5	<0.5	<0.5	----	
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	0.6	0.6	0.6	----	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	1.2	1.2	1.2	----	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg	----	<10	<10	<10	----	
C10 - C14 Fraction	----	50	mg/kg	----	<50	<50	<50	----	
C15 - C28 Fraction	----	100	mg/kg	----	<100	<100	170	----	
C29 - C36 Fraction	----	100	mg/kg	----	<100	<100	360	----	
^ C10 - C36 Fraction (sum)	----	50	mg/kg	----	<50	<50	530	----	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg	----	<10	<10	<10	----	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	<10	<10	<10	----	
>C10 - C16 Fraction	----	50	mg/kg	----	<50	<50	<50	----	
>C16 - C34 Fraction	----	100	mg/kg	----	<100	<100	440	----	
>C34 - C40 Fraction	----	100	mg/kg	----	<100	<100	250	----	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	----	<50	<50	690	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	<50	<50	<50	----	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	----	<0.2	<0.2	<0.2	----	
Toluene	108-88-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	----	
Ethylbenzene	100-41-4	0.5	mg/kg	----	<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	----	
ortho-Xylene	95-47-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	----	
^ Sum of BTEX	----	0.2	mg/kg	----	<0.2	<0.2	<0.2	----	
^ Total Xylenes	----	0.5	mg/kg	----	<0.5	<0.5	<0.5	----	
Naphthalene	91-20-3	1	mg/kg	----	<1	<1	<1	----	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%	----	66.3	77.3	76.3	----	
2-Chlorophenol-D4	93951-73-6	0.5	%	----	77.4	74.0	66.4	----	
2,4,6-Tribromophenol	118-79-6	0.5	%	----	58.6	72.6	36.3	----	
EP075(SIM)T: PAH Surrogates									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB14_0.1	SB14_0.4	SB14_0.8	SB15_0.1-0.2	SB16_0.2-0.3
Client sampling date / time					04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00
Compound	CAS Number	LOR	Unit		ES1819892-006	ES1819892-007	ES1819892-008	ES1819892-009	ES1819892-011
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued									
2-Fluorobiphenyl	321-60-8	0.5	%		----	73.8	82.6	74.9	----
Anthracene-d10	1719-06-8	0.5	%		----	80.1	90.3	77.5	----
4-Terphenyl-d14	1718-51-0	0.5	%		----	79.3	89.7	78.8	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		----	90.7	95.9	97.9	----
Toluene-D8	2037-26-5	0.2	%		----	85.0	85.7	90.6	----
4-Bromofluorobenzene	460-00-4	0.2	%		----	84.2	88.0	84.9	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB16_0.5-0.6	SB16_0.8	SB17_0.1	SB17_0.9	QC05
Client sampling date / time					04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00
Compound	CAS Number	LOR	Unit		ES1819892-012	ES1819892-013	ES1819892-014	ES1819892-015	ES1819892-016
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		23.3	20.9	----	26.2	27.0
EA200: AS 4964 - 2004 Identification of Asbestos in Soils									
Asbestos Detected	1332-21-4	0.1	g/kg		----	----	No	----	----
Asbestos (Trace)	1332-21-4	5	Fibres		----	----	No	----	----
Asbestos Type	1332-21-4	-	--		----	----	-	----	----
Sample weight (dry)	----	0.01	g		----	----	49.4	----	----
APPROVED IDENTIFIER:	----	-	--		----	----	S.SPOONER	----	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	9	----	10	11
Cadmium	7440-43-9	1	mg/kg		<1	<1	----	<1	<1
Chromium	7440-47-3	2	mg/kg		4	34	----	30	30
Copper	7440-50-8	5	mg/kg		35	15	----	23	24
Lead	7439-92-1	5	mg/kg		21	27	----	29	31
Nickel	7440-02-0	2	mg/kg		12	5	----	4	4
Zinc	7440-66-6	5	mg/kg		25	9	----	10	10
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	----	<0.1	<0.1
EN33: TCLP Leach									
Initial pH	----	0.1	pH Unit		6.7	----	----	----	----
After HCl pH	----	0.1	pH Unit		1.4	----	----	----	----
Extraction Fluid Number	----	1	-		1	----	----	----	----
Final pH	----	0.1	pH Unit		4.9	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<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
Chrysene	218-01-9	0.5	mg/kg		<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



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB16_0.5-0.6	SB16_0.8	SB17_0.1	SB17_0.9	QC05
Client sampling date / time					04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00
Compound	CAS Number	LOR	Unit		ES1819892-012	ES1819892-013	ES1819892-014	ES1819892-015	ES1819892-016
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<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
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<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
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg		<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
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<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
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	1.2	----	1.2	1.2
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	----	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	----	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	----	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	----	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	----	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	----	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	----	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	----	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	----	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	----	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	----	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	----	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	----	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<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
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	----	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	----	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	----	<1	<1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB16_0.5-0.6	SB16_0.8	SB17_0.1	SB17_0.9	QC05
Client sampling date / time					04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00	04-Jul-2018 00:00
Compound	CAS Number	LOR	Unit		ES1819892-012	ES1819892-013	ES1819892-014	ES1819892-015	ES1819892-016
				Result	Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		61.7	72.5	----	73.9	71.0
2-Chlorophenol-D4	93951-73-6	0.5	%		66.5	71.5	----	73.5	70.5
2,4,6-Tribromophenol	118-79-6	0.5	%		42.8	66.6	----	67.4	67.2
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		77.2	78.1	----	78.8	77.2
Anthracene-d10	1719-06-8	0.5	%		71.7	85.3	----	86.7	80.8
4-Terphenyl-d14	1718-51-0	0.5	%		68.0	84.7	----	85.6	83.5
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		92.1	90.8	----	90.9	90.2
Toluene-D8	2037-26-5	0.2	%		82.1	85.2	----	77.5	76.9
4-Bromofluorobenzene	460-00-4	0.2	%		80.0	81.3	----	75.5	79.4



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB18_0.2-0.3	SB19_0.1-0.2	T.B.	----	----
Client sampling date / time					04-Jul-2018 00:00	04-Jul-2018 00:00	03-Jul-2018 00:00	----	----
Compound	CAS Number	LOR	Unit		ES1819892-017	ES1819892-018	ES1819892-021	-----	-----
					Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		13.9	19.3	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils									
Asbestos Detected	1332-21-4	0.1	g/kg		No	No	----	----	----
Asbestos (Trace)	1332-21-4	5	Fibres		No	No	----	----	----
Asbestos Type	1332-21-4	-	--		-	-	----	----	----
Sample weight (dry)	----	0.01	g		36.9	35.6	----	----	----
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		20	15	----	----	----
Copper	7440-50-8	5	mg/kg		34	24	----	----	----
Lead	7439-92-1	5	mg/kg		206	38	----	----	----
Nickel	7440-02-0	2	mg/kg		7	7	----	----	----
Zinc	7440-66-6	5	mg/kg		255	56	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	----	----	----
EN33: TCLP Leach									
Initial pH	----	0.1	pH Unit		7.2	----	----	----	----
After HCl pH	----	0.1	pH Unit		1.4	----	----	----	----
Extraction Fluid Number	----	1	-		1	----	----	----	----
Final pH	----	0.1	pH Unit		4.9	----	----	----	----
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	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		2.9	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg		0.8	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		8.4	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg		9.3	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		4.5	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg		4.8	<0.5	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		6.4	<0.5	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB18_0.2-0.3	SB19_0.1-0.2	T.B.	----	----
Client sampling date / time					04-Jul-2018 00:00	04-Jul-2018 00:00	03-Jul-2018 00:00	----	----
Compound	CAS Number	LOR	Unit		ES1819892-017	ES1819892-018	ES1819892-021	-----	-----
					Result	Result	Result	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		2.4	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		4.9	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		2.4	<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		3.5	<0.5	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		50.8	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		7.0	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		7.0	0.6	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		7.0	1.2	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	----	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg		220	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg		200	<100	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		420	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		370	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		110	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		480	<50	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<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	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	----	----
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB18_0.2-0.3	SB19_0.1-0.2	T.B.	----	----
Client sampling date / time					04-Jul-2018 00:00	04-Jul-2018 00:00	03-Jul-2018 00:00	----	----
Compound	CAS Number	LOR	Unit		ES1819892-017	ES1819892-018	ES1819892-021	-----	-----
				Result	Result	Result		----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		78.2	76.1	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		77.3	69.4	----	----	----
2,4,6-Tribromophenol	118-79-6	0.5	%		71.8	34.4	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		83.0	79.2	----	----	----
Anthracene-d10	1719-06-8	0.5	%		86.0	78.7	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		85.7	82.7	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		95.0	92.7	94.6	----	----
Toluene-D8	2037-26-5	0.2	%		83.6	79.0	78.5	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		82.4	76.8	78.8	----	----

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 Work Order : ES1819892
 Client : SULLIVAN ENVIRONMENTAL SCIENCES
 Project : SES_442



Analytical Results

Sub-Matrix: **SOLID**
 (Matrix: **SOLID**)

Client sample ID

				FC01	----	----	----	----
Client sampling date / time				04-Jul-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1819892-020	-----	-----	-----	-----
Result				----	----	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples								
Asbestos Detected	1332-21-4	0.1	g/kg	No	----	----	----	----
Asbestos Type	1332-21-4	-	--	-	----	----	----	----
Sample weight (dry)	----	0.01	g	5.26	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	A. SMYLIE	----	----	----	----



Analytical Results

Sub-Matrix: **TCLP LEACHATE**
 (Matrix: **WATER**)

Client sample ID

				SB16_0.5-0.6	SB18_0.2-0.3	----	----	----
Client sampling date / time				04-Jul-2018 00:00	04-Jul-2018 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES1819892-012	ES1819892-017	-----	-----	-----
				Result	Result	----	----	----
EG005C: Leachable Metals by ICPAES								
Arsenic	7440-38-2	0.1	mg/L	<0.1	<0.1	----	----	----
Cadmium	7440-43-9	0.05	mg/L	<0.05	<0.05	----	----	----
Lead	7439-92-1	0.1	mg/L	<0.1	<0.1	----	----	----
Nickel	7440-02-0	0.1	mg/L	<0.1	<0.1	----	----	----
EG035C: Leachable Mercury by FIMS								
Mercury	7439-97-6	0.0010	mg/L	<0.0010	<0.0010	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1.0	%	21.9	22.2	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%	59.0	60.2	----	----	----
2,4,6-Tribromophenol	118-79-6	1.0	%	65.6	54.3	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1.0	%	73.4	70.6	----	----	----
Anthracene-d10	1719-06-8	1.0	%	73.1	69.5	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%	92.2	85.5	----	----	----

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	SB12_0.1 - 04-Jul-2018 00:00	Mid brown sandy soil.
EA200: Description	SB14_0.1 - 04-Jul-2018 00:00	Mid brown sandy soil.
EA200: Description	SB15_0.1-0.2 - 04-Jul-2018 00:00	Mid brown sandy soil.
EA200: Description	SB16_0.2-0.3 - 04-Jul-2018 00:00	Mid grey sandy soil.
EA200: Description	SB17_0.1 - 04-Jul-2018 00:00	Mid brown sandy soil.
EA200: Description	SB18_0.2-0.3 - 04-Jul-2018 00:00	Mid brown sandy soil.
EA200: Description	SB19_0.1-0.2 - 04-Jul-2018 00:00	Mid brown sandy soil.

Sub-Matrix: **SOLID**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples		
EA200: Description	FC01 - 04-Jul-2018 00:00	One piece of cement sheeting



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
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: TCLP LEACHATE		Recovery Limits (%)	
Compound	CAS Number	Low	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

QUALITY CONTROL REPORT

Work Order	: ES1819892	Page	: 1 of 9
Client	: SULLIVAN ENVIRONMENTAL SCIENCES	Laboratory	: Environmental Division Sydney
Contact	: ADAM SULLIVAN	Contact	: Customer Services ES
Address	: PO Box 5248 TURRAMURRA NSW 2074	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: SES_442	Date Samples Received	: 05-Jul-2018
Order number	: ----	Date Analysis Commenced	: 09-Jul-2018
C-O-C number	: ----	Issue Date	: 12-Jul-2018
Sampler	: ----		
Site	: ----		
Quote number	: EN/222/17		
No. of samples received	: 21		
No. of samples analysed	: 19		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Edwandy Fadjjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Gerrad Morgan	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Ivan Taylor	Analyst	Sydney Inorganics, 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**

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 (Dried @ 105-110°C) (QC Lot: 1785233)									
ES1819891-023	Anonymous	EA055: Moisture Content	----	0.1	%	32.6	34.7	6.18	0% - 20%
ES1819892-003	QC04	EA055: Moisture Content	----	0.1	%	23.6	22.0	6.78	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1785234)									
ES1819892-016	QC05	EA055: Moisture Content	----	0.1	%	27.0	26.4	2.12	0% - 20%
ES1819977-003	Anonymous	EA055: Moisture Content	----	0.1	%	24.8	25.7	3.20	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 1792332)									
ES1819891-021	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	3	<2	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	5	5	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	176	181	2.68	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	19	<5	118	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	41	39	6.40	No Limit
ES1819891-031	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	4	5	27.8	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	5	5	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	183	152	18.7	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	22	50	77.4	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	496	# 392	23.3	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 1792623)									
ES1819838-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	15	15	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	15	14	0.00	No Limit

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 Client : SULLIVAN ENVIRONMENTAL SCIENCES
 Project : SES_442



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 (%)
EG005T: Total Metals by ICP-AES (QC Lot: 1792623) - continued									
ES1819838-001	Anonymous	EG005T: Arsenic	7440-38-2	5	mg/kg	12	28	78.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	68	76	11.0	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	45	39	14.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	75	# 106	33.4	0% - 20%
ES1820089-002	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	38	35	9.27	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	5	4	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	28	26	8.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	37	39	7.01	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	29	36	20.7	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	82	80	2.80	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1792333)									
ES1819891-021	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1819891-031	Anonymous	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: 1792624)									
ES1819838-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1820089-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.1	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1782596)									
ES1819892-001	SB12_0.1	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	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			205-82-3						
		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
ES1819892-015	SB17_0.9	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

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 (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1782596) - continued									
ES1819892-015	SB17_0.9	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	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			205-82-3						
		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): Dibenzo(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: 1782597)									
ES1819892-001	SB12_0.1	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
ES1819892-015	SB17_0.9	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 Petroleum Hydrocarbons (QC Lot: 1784239)									
ES1819892-001	SB12_0.1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1819892-015	SB17_0.9	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1782597)									
ES1819892-001	SB12_0.1	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
ES1819892-015	SB17_0.9	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: 1784239)									
ES1819892-001	SB12_0.1	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1819892-015	SB17_0.9	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 1784239)									

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 Work Order : ES1819892
 Client : SULLIVAN ENVIRONMENTAL SCIENCES
 Project : SES_442



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 (%)
EP080: BTEXN (QC Lot: 1784239) - continued									
ES1819892-001	SB12_0.1	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
ES1819892-015	SB17_0.9	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 Duplicate (DUP) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005C: Leachable Metals by ICPAES (QC Lot: 1790872)									
ES1819595-048	Anonymous	EG005C: Cadmium	7440-43-9	0.05	mg/L	<0.05	<0.05	0.00	No Limit
		EG005C: Arsenic	7440-38-2	0.1	mg/L	<0.1	<0.1	0.00	No Limit
		EG005C: Lead	7439-92-1	0.1	mg/L	<0.1	<0.1	0.00	No Limit
		EG005C: Nickel	7440-02-0	0.1	mg/L	<0.1	<0.1	0.00	No Limit
ES1819595-065	Anonymous	EG005C: Cadmium	7440-43-9	0.05	mg/L	<0.05	<0.05	0.00	No Limit
		EG005C: Arsenic	7440-38-2	0.1	mg/L	<0.1	<0.1	0.00	No Limit
		EG005C: Lead	7439-92-1	0.1	mg/L	<0.1	<0.1	0.00	No Limit
		EG005C: Nickel	7440-02-0	0.1	mg/L	<0.1	<0.1	0.00	No Limit
EG035C: Leachable Mercury by FIMS (QC Lot: 1787948)									
ES1819892-012	SB16_0.5-0.6	EG035C: Mercury	7439-97-6	0.0001	mg/L	<0.0010	<0.0010	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**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG005T: Total Metals by ICP-AES (QCLot: 1792332)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	97.7	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	100.0	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	104	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	108	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	98.2	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	108	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	116	80	122
EG005T: Total Metals by ICP-AES (QCLot: 1792623)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	102	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	97.7	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	102	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	101	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	98.3	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	103	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	110	80	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1792333)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	77.3	70	105
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1792624)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	76.8	70	105
EN33: TCLP Leach (QCLot: 1784444)								
EN33a: Initial pH	----	0.1	pH Unit	1.0	----	----	----	----
EN33a: After HCl pH	----	0.1	pH Unit	1.0	----	----	----	----
EN33a: Final pH	----	0.1	pH Unit	7.0	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1782596)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	95.3	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	92.4	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	88.5	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	89.5	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	95.5	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	95.7	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	95.2	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	95.3	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	95.0	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	98.9	75	127



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1782596) - continued								
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	6 mg/kg	94.1	68	116
	205-82-3							
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	104	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	93.7	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	86.9	61	121
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	83.8	62	118
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	89.1	63	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1782597)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	105	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	106	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	106	71	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1784239)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	83.2	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1782597)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	103	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	109	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	150 mg/kg	82.4	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1784239)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	86.0	68	128
EP080: BTEXN (QCLot: 1784239)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	89.5	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	85.8	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	83.2	65	117
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	80.8	66	118
	106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	85.9	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	94.1	63	119

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG005C: Leachable Metals by ICPAES (QCLot: 1790872)								
EG005C: Arsenic	7440-38-2	0.1	mg/L	<0.1	0.1 mg/L	89.0	80	124
EG005C: Cadmium	7440-43-9	0.05	mg/L	<0.05	0.1 mg/L	91.9	80	118
EG005C: Lead	7439-92-1	0.1	mg/L	<0.1	0.1 mg/L	89.7	80	118
EG005C: Nickel	7440-02-0	0.1	mg/L	<0.1	0.1 mg/L	94.3	83	115
EG035C: Leachable Mercury by FIMS (QCLot: 1787948)								
EG035C: Mercurv	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	91.9	79	109



Sub-Matrix: **SOIL**

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: 1784239) - continued							
ES1819892-001	SB12_0.1	EP080: C6 - C9 Fraction	----	32.5 mg/kg	101	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1782597)							
ES1819892-001	SB12_0.1	EP071: >C10 - C16 Fraction	----	860 mg/kg	110	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	115	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	101	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1784239)							
ES1819892-001	SB12_0.1	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	102	70	130
EP080: BTEXN (QCLot: 1784239)							
ES1819892-001	SB12_0.1	EP080: Benzene	71-43-2	2.5 mg/kg	99.0	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	99.7	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	99.4	70	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	102	70	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	101	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	103	70	130

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005C: Leachable Metals by ICPAES (QCLot: 1790872)							
ES1819595-050	Anonymous	EG005C: Arsenic	7440-38-2	1 mg/L	92.7	70	130
		EG005C: Cadmium	7440-43-9	0.25 mg/L	88.3	70	130
		EG005C: Lead	7439-92-1	1 mg/L	84.8	70	130
		EG005C: Nickel	7440-02-0	1 mg/L	87.0	70	130
EG035C: Leachable Mercury by FIMS (QCLot: 1787948)							
ES1819892-017	SB18_0.2-0.3	EG035C: Mercury	7439-97-6	0.01 mg/L	96.1	70	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES1819892	Page	: 1 of 9
Client	: SULLIVAN ENVIRONMENTAL SCIENCES	Laboratory	: Environmental Division Sydney
Contact	: ADAM SULLIVAN	Telephone	: +61-2-8784 8555
Project	: SES_442	Date Samples Received	: 05-Jul-2018
Site	: ----	Issue Date	: 12-Jul-2018
Sampler	: ----	No. of samples received	: 21
Order number	:	No. of samples analysed	: 19

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 Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- Duplicate outliers exist - please see following pages for full details.
- Surrogate recovery outliers exist for all regular sample matrices - please see following pages for full details.

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

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 Work Order : ES1819892
 Client : SULLIVAN ENVIRONMENTAL SCIENCES
 Project : SES_442



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EG005T: Total Metals by ICP-AES	ES1819838--001	Anonymous	Zinc	7440-66-6	33.4 %	0% - 20%	RPD exceeds LOR based limits
EG005T: Total Metals by ICP-AES	ES1819891--031	Anonymous	Zinc	7440-66-6	23.3 %	0% - 20%	RPD exceeds LOR based limits

Regular Sample Surrogates

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP075(SIM)S: Phenolic Compound Surrogates	ES1819892-012	SB16_0.5-0.6	Phenol-d6	13127-88-3	61.7 %	63-123 %	Recovery less than lower data quality objective
EP075(SIM)S: Phenolic Compound Surrogates	ES1819892-009	SB15_0.1-0.2	2.4.6-Tribromophenol	118-79-6	36.3 %	40-138 %	Recovery less than lower data quality objective
EP075(SIM)S: Phenolic Compound Surrogates	ES1819892-018	SB19_0.1-0.2	2.4.6-Tribromophenol	118-79-6	34.4 %	40-138 %	Recovery less than lower data quality objective

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	7	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	7	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	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation



Matrix: **SOIL**

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

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) SB12_0.1, SB12_0.4-0.5, QC04, SB13_0.1-0.2, SB13_0.8, SB14_0.4, SB14_0.8, SB15_0.1-0.2, SB16_0.5-0.6, SB16_0.8, SB17_0.9, QC05, SB18_0.2-0.3, SB19_0.1-0.2	04-Jul-2018	----	----	----	09-Jul-2018	18-Jul-2018	✓
EA200: AS 4964 - 2004 Identification of Asbestos in Soils							
Snap Lock Bag: Separate bag received (EA200) SB12_0.1, SB14_0.1, SB15_0.1-0.2, SB16_0.2-0.3, SB17_0.1, SB18_0.2-0.3, SB19_0.1-0.2	04-Jul-2018	----	----	----	10-Jul-2018	31-Dec-2018	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) SB12_0.1, SB12_0.4-0.5, QC04, SB13_0.1-0.2, SB13_0.8, SB14_0.4, SB14_0.8, SB15_0.1-0.2, SB16_0.5-0.6, SB16_0.8, SB17_0.9, QC05, SB18_0.2-0.3, SB19_0.1-0.2	04-Jul-2018	11-Jul-2018	31-Dec-2018	✓	11-Jul-2018	31-Dec-2018	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) SB12_0.1, SB12_0.4-0.5, QC04, SB13_0.1-0.2, SB13_0.8, SB14_0.4, SB14_0.8, SB15_0.1-0.2, SB16_0.5-0.6, SB16_0.8, SB17_0.9, QC05, SB18_0.2-0.3, SB19_0.1-0.2	04-Jul-2018	11-Jul-2018	01-Aug-2018	✓	12-Jul-2018	01-Aug-2018	✓
EN33: TCLP Leach							
Non-Volatile Leach: 14 day HT(e.g. SV organics) (EN33a) SB16_0.5-0.6, SB18_0.2-0.3	04-Jul-2018	09-Jul-2018	18-Jul-2018	✓	----	----	----



Matrix: **SOIL**

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP075(SIM))		04-Jul-2018	10-Jul-2018	18-Jul-2018	✓	10-Jul-2018	19-Aug-2018	✓
SB12_0.1, SB12_0.4-0.5, QC04, SB13_0.1-0.2, SB13_0.8, SB14_0.4, SB14_0.8, SB15_0.1-0.2, SB16_0.5-0.6, SB16_0.8, SB17_0.9, QC05, SB18_0.2-0.3, SB19_0.1-0.2								
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP080)		04-Jul-2018	09-Jul-2018	18-Jul-2018	✓	09-Jul-2018	18-Jul-2018	✓
SB12_0.1, SB12_0.4-0.5, QC04, SB13_0.1-0.2, SB13_0.8, SB14_0.4, SB14_0.8, SB15_0.1-0.2, SB16_0.5-0.6, SB16_0.8, SB17_0.9, QC05, SB18_0.2-0.3, SB19_0.1-0.2								
Soil Glass Jar - Unpreserved (EP071)		04-Jul-2018	10-Jul-2018	18-Jul-2018	✓	10-Jul-2018	19-Aug-2018	✓
SB12_0.1, SB12_0.4-0.5, QC04, SB13_0.1-0.2, SB13_0.8, SB14_0.4, SB14_0.8, SB15_0.1-0.2, SB16_0.5-0.6, SB16_0.8, SB17_0.9, QC05, SB18_0.2-0.3, SB19_0.1-0.2								
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP080)		04-Jul-2018	09-Jul-2018	18-Jul-2018	✓	09-Jul-2018	18-Jul-2018	✓
SB12_0.1, SB12_0.4-0.5, QC04, SB13_0.1-0.2, SB13_0.8, SB14_0.4, SB14_0.8, SB15_0.1-0.2, SB16_0.5-0.6, SB16_0.8, SB17_0.9, QC05, SB18_0.2-0.3, SB19_0.1-0.2								
Soil Glass Jar - Unpreserved (EP071)		04-Jul-2018	10-Jul-2018	18-Jul-2018	✓	10-Jul-2018	19-Aug-2018	✓
SB12_0.1, SB12_0.4-0.5, QC04, SB13_0.1-0.2, SB13_0.8, SB14_0.4, SB14_0.8, SB15_0.1-0.2, SB16_0.5-0.6, SB16_0.8, SB17_0.9, QC05, SB18_0.2-0.3, SB19_0.1-0.2								

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Matrix: **SOLID** Evaluation: **x** = Holding time breach ; **✓** = Within holding time.

Matrix: **WATER** Evaluation: **x** = Holding time breach ; **✓** = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG005C: Leachable Metals by ICPAES							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG005C) SB16_0.5-0.6, SB18_0.2-0.3	09-Jul-2018	11-Jul-2018	05-Jan-2019	✓	11-Jul-2018	05-Jan-2019	✓
EG035C: Leachable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035C) SB16_0.5-0.6, SB18_0.2-0.3	09-Jul-2018	----	----	----	10-Jul-2018	06-Aug-2018	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) SB16_0.5-0.6, SB18_0.2-0.3	09-Jul-2018	10-Jul-2018	16-Jul-2018	✓	10-Jul-2018	19-Aug-2018	✓



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	4	40	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	4	40	10.00	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	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	40	5.00	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	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TCLP for Non & Semivolatile Analytes	EN33a	1	11	9.09	9.09	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	40	5.00	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	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	40	5.00	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	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	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	
Laboratory Duplicates (DUP)							
Leachable Mercury by FIMS	EG035C	1	2	50.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Leachable Metals by ICPAES	EG005C	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	7	0.00	10.00	✗	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Leachable Mercury by FIMS	EG035C	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Leachable Metals by ICPAES	EG005C	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

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 Work Order : ES1819892
 Client : SULLIVAN ENVIRONMENTAL SCIENCES
 Project : SES_442



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 Control Samples (LCS) - Continued							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Leachable Mercury by FIMS	EG035C	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Leachable Metals by ICPAES	EG005C	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Leachable Mercury by FIMS	EG035C	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Leachable Metals by ICPAES	EG005C	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	7	0.00	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	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 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
Leachable Metals by ICPAES	EG005C	SOIL	In house: referenced to APHA 3120; USEPA SW 846 - 6010: The ICPAES technique ionises leachate sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (2013) Schedule B(3)
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)
Leachable Mercury by FIMS	EG035C	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the TCLP solution. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ 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)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂) (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 SnCl ₂ 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)
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. Compliant with NEPM amended 2013.
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	SOIL	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	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. Compliant with NEPM amended 2013.
Asbestos Identification in Bulk Solids	EA200	SOLID	In house: Referenced to AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals in TCLP Leachate	EN25C	SOIL	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)



Preparation Methods	Method	Matrix	Method Descriptions
TCLP for Non & Semivolatile Analytes	EN33a	SOIL	In house QWI-EN/33 referenced to USEPA SW846-1311: The TCLP procedure is designed to determine the mobility of both organic and inorganic analytes present in wastes. The standard TCLP leach is for non-volatile and Semivolatile test parameters.
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)
Separatory Funnel Extraction of Liquids	ORG14	SOIL	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.
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.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ES1819892

Client : SULLIVAN ENVIRONMENTAL SCIENCES Contact : ADAM SULLIVAN Address : PO Box 5248 TURRAMURRA NSW 2074 E-mail : adam@sullivan-es.com.au Telephone : ---- Facsimile : ---- Project : SES_442 Order number : C-O-C number : ---- Site : ---- Sampler :	Laboratory : Environmental Division Sydney Contact : Customer Services ES Address : 277-289 Woodpark Road Smithfield NSW Australia 2164 E-mail : ALSEnviro.Sydney@alsglobal.com Telephone : +61-2-8784 8555 Facsimile : +61-2-8784 8500 Page : 1 of 3 Quote number : ES2015SULENV0034 (EN/222/17) QC Level : NEPM 2013 B3 & ALS QC Standard
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Dates

Date Samples Received : 05-Jul-2018 13:30 Client Requested Due Date : 12-Jul-2018	Issue Date : 06-Jul-2018 Scheduled Reporting Date : 12-Jul-2018
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Delivery Details

Mode of Delivery : Undefined No. of coolers/boxes : 1 Receipt Detail :	Security Seal : Not Available Temperature : 2.3 No. of samples received / analysed : 21 / 19
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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
- **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 (3 weeks), Solid (2 months) from receipt of samples.



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 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EA200 Asbestos Identification in Soils -	SOIL - EG005C Leachable Metals by ICPAES	SOIL - EG035C Leachable Mercury	SOIL - EP075 SIM PAH only SIM - PAH only	SOIL - S-26 8 metals/TRH/BTEXN/PAH
ES1819892-001	04-Jul-2018 00:00	SB12_0.1		✓	✓				✓
ES1819892-002	04-Jul-2018 00:00	SB12_0.4-0.5		✓					✓
ES1819892-003	04-Jul-2018 00:00	QC04		✓					✓
ES1819892-004	04-Jul-2018 00:00	SB13_0.1-0.2		✓					✓
ES1819892-005	04-Jul-2018 00:00	SB13_0.8		✓					✓
ES1819892-006	04-Jul-2018 00:00	SB14_0.1			✓				
ES1819892-007	04-Jul-2018 00:00	SB14_0.4		✓					✓
ES1819892-008	04-Jul-2018 00:00	SB14_0.8		✓					✓
ES1819892-009	04-Jul-2018 00:00	SB15_0.1-0.2		✓	✓				✓
ES1819892-010	04-Jul-2018 00:00	SB16_0.1-0.2	✓						
ES1819892-011	04-Jul-2018 00:00	SB16_0.2-0.3			✓				
ES1819892-012	04-Jul-2018 00:00	SB16_0.5-0.6		✓		✓	✓	✓	✓
ES1819892-013	04-Jul-2018 00:00	SB16_0.8		✓					✓
ES1819892-014	04-Jul-2018 00:00	SB17_0.1			✓				
ES1819892-015	04-Jul-2018 00:00	SB17_0.9		✓					✓
ES1819892-016	04-Jul-2018 00:00	QC05		✓					✓
ES1819892-017	04-Jul-2018 00:00	SB18_0.2-0.3		✓	✓	✓	✓	✓	✓
ES1819892-018	04-Jul-2018 00:00	SB19_0.1-0.2		✓	✓				✓
ES1819892-019	04-Jul-2018 00:00	SB19_0.5	✓						

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EN33a TCLP Leachate	SOIL - EP080 BTEXN
ES1819892-012	04-Jul-2018 00:00	SB16_0.5-0.6	✓	
ES1819892-017	04-Jul-2018 00:00	SB18_0.2-0.3	✓	
ES1819892-021	03-Jul-2018 00:00	T.B.		✓



Matrix: **SOLID**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOLID - EA200B Asbestos Identification in Bulk Solids (Excluding)
ES1819892-020	04-Jul-2018 00:00	FC01	✓

Proactive Holding Time Report

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

Requested Deliverables

ADAM SULLIVAN

- *AU Certificate of Analysis - NATA (COA)	Email	adam@sullivan-es.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	adam@sullivan-es.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	adam@sullivan-es.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	adam@sullivan-es.com.au
- A4 - AU Tax Invoice (INV)	Email	adam@sullivan-es.com.au
- Chain of Custody (CoC) (COC)	Email	adam@sullivan-es.com.au
- EDI Format - ENMRG (ENMRG)	Email	adam@sullivan-es.com.au
- EDI Format - XTab (XTAB)	Email	adam@sullivan-es.com.au

CHAIN OF CUSTODY FORM

Sheet 2 of 2

THIS COLUMN FOR LAB USE ONLY		FROM: SULLIVAN Environmental Sciences PO Box 5248 Turramurra NSW 2074 Ph: 0400 500 264 Email: adam@sullivan-es.com.au		DATE: 4/7/18		TO: ALS Environmental Smithfield		Container Size, Type, Preservative and Analysis																																			
Job Code:	Due Date:	Project No: SES-442	Project Manager: A. Sullivan	Signature(s):	Agreement No: EN-222-17	Checked:	Released by: [Signature]	Date: 5/7/18	Time: 11am	Received by: R. Smith	Date: 5/7/18	Time: 1:30pm	<table border="1"> <thead> <tr> <th>Size</th> <th>Type*</th> <th>Preservative Code</th> <th colspan="6">Container Identification</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>						Size	Type*	Preservative Code	Container Identification																					
Size	Type*	Preservative Code	Container Identification																																								
Custody seal intact? YES ☐ NO ☐		Sample cold? YES ☐ NO ☐		Date: 5/7/18		Time: 11am				Date: 5/7/18		Time: 1:30pm		<table border="1"> <thead> <tr> <th>Analytes</th> <th>S-26</th> <th>Asbestos 10 in soil/material</th> <th>TCLP - Metals (As, Cd, Ni, Pb, Hg) BAP</th> <th>BTEXN</th> <th>HOLD</th> </tr> </thead> </table>						Analytes	S-26	Asbestos 10 in soil/material	TCLP - Metals (As, Cd, Ni, Pb, Hg) BAP	BTEXN	HOLD																		
Analytes	S-26	Asbestos 10 in soil/material	TCLP - Metals (As, Cd, Ni, Pb, Hg) BAP	BTEXN	HOLD																																						
Lab Identification	Date	Time	Matrix	Sample Number	Comments	Total no	Tick required	analytes																																			
13	4/7/18		Solid	SB16-0.8		1	X																																				
14				SB17-0.1	+ Bag	2	X																																				
15				SB17-0.9		1	X																																				
16				QC05		1	X																																				
17				SB18-0.2-0.3	+ Bag	2	X																																				
18				SB19-0.1-0.2	+ Bag	2	X																																				
19				SB19-0.5		1																																					
20				FC01		1																																					
21				T.B.	Bag	1																																					
TOTAL						12	5	4	1	1	1																																
Remarks:																																											
* Container Type and Preservative Codes: P = Neutral Plastic; N = Nitric Acid Preserved; C = Sodium Hydroxide Preserved; J = Solvent Washed Acid Rinsed Jar; S = Solvent Washed Acid Rinsed Glass Bottle; VC = Hydrochloric Acid Preserved Vial; VS = Sulfuric Acid Preserved Vial; BS = Sulfuric Acid Preserved Glass Bottle; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle																																											
Courier Job No:													Specify Turnaround Time:																														
NOTE: SAMPLES MAY CONTAIN DANGEROUS AND HAZARDOUS SUBSTANCES																																											