

Technical Memo

To: CPB Contracting	From: Brad May	Attention: [sch4p4(6) Perso]
Email: [sch4p4(6) Pe]@cpbcon.com.au		
Project No: B160268.01	Date: 13 October 2016	
Subject: Rail Ballast Remediation Plan Methodology		

This Remedial Plan (RP) has been prepared for the property located in the alignment of the Gold Coast Light Rail Project Stage 2 (GCLR2). The focus of this RP is limited to the 2 areas that have been identified as containing historical rail ballast (The Site). The location of the rail ballast is shown on the attached site plans for the 2 areas located on Lot 202 SP260950 and Lot 3 RP887429.

1 INTRODUCTION

1.1 PURPOSE OF THE RP

The purpose of this RP is to provide an outline of objectives, activities and procedures for the effective and controlled management of the site as part of the construction of the GCLR2. It describes the methodologies and standards to be followed throughout the project to facilitate successful remediation and to protect human health and the environment.

1.2 OBJECTIVE

The primary objective of the program at the site is to remediate in a manner that minimises the potential release of contaminants from the ballast and to protect human health and the environment.

The site is to be listed on the EMR as a result of Hazardous Contaminants in accordance with the DEHP Guideline ESR/2016/2044.

1.3 SUITABLY QUALIFIED PERSON

A Suitably Qualified Person (SQP) in accordance with Section 381 and Section 395 of the Environmental Protection Act (1994) must conduct all investigations, supervise all remediation works and compile report/s required to remediate the Site.

2 CONTAMINATION SUMMARY

The historical ballast was encountered following the initial vegetation clearing of the area in early September. It is believed that the ballast is a remnant of the original Beenleigh to Southport line that was decommissioned in 1964. The volume and location of historical ballast located at the two separate areas has been surveyed by CPB as indicated below:

- Lot 202/SP260950 (Chainage 13973 to 14160) - Volume: 1,061.16 m³
- Lot 3 RP 887429 (Chainage 15020 – 15120) - Volume: 445.17 m³
- Additional surrounding material to ensure all contamination is removed.

CPB field staff collected samples from the Ballast on 2 September 2016 across the ballast profile and submitted 33 samples for laboratory analysis. The laboratory analysis included:

- Heavy Metals;
- Pesticides,
- Polychlorinated Biphenyls;
- Polynuclear Aromatic Hydrocarbons;
- Total Recoverable Hydrocarbons;
- Phenols; and
- Benzene, Toluene, Ethylbenzene, Xylene, Naphthalene.

Epic reviewed the laboratory information and requested that further analysis be conducted to include eight samples for asbestos and eight samples for a neutral leach (deionised water) specifically for arsenic. The purpose of the neutral leach assessment was to determine if the arsenic concentrations identified in the ballast were leachable under simulated natural rainfall conditions.

2.1 RESULTS SUMMARY

The results from the initial laboratory analysis returned elevated concentrations for arsenic and total recoverable hydrocarbons (TRH). The elevated TRH results were however only marginally above the Ecological Screening Levels (ESL) for urban residential and open space with only one sample returning a result above Health Screening Levels (HSL) - A residential landuse.

The arsenic concentrations however exceeded the HSL-A residential criteria in 17 of the 33 samples analysed, with 16 samples also exceeding the ESL for Commercial and Industrial landuse. The results have been summarised in the attached **Table T1** and **Table T2**.

The subsequent neutral leaching potential analysis for requested arsenic returned results that indicated leachable concentrations ranging from <0.01ug/L to 1.14ug/L with seven of the eight samples submitted returning arsenic above the level of reporting.

3 SITE DESCRIPTION

3.1 SITE LOCATION LAYOUT AND TOPOGRAPHY

The sites are described as outlined in **Table 1**. The site is located adjacent to the rail construction corridor within the Intra-Regional Transport Corridor (IRTC).

Table 1: Site Identification Details

Property Aspect	Description
Street Address	N/A
Title Identifier	Lot 202 SP260950 and Lot 3 RP887429.
Land Use Zoning	Transport Corridor
Local Government Area	Gold Coast Council
Closest surface water	Coombabah Creek
Sensitive environmental Receptors	Coombabah Creek catchment
Surrounding Land Uses	Industrial and future residential
	Future Residential
	IRTC
	Rail corridor

4 REMEDIATION PLAN

The purpose of this remedial plan is to make the site suitable for the construction of the GCLR2. The remedial goal includes the excavation of impacted material with the intent of reburial onsite below a low permeability capping material and marker layer within the new light rail embankment. It is not intended to remove impacted material from the site. The current location of the ballast will be assessed by the SQP and validated once relocation has been completed.

4.1 STRATEGY APPLIED

The remedial strategy for this site is based upon separation of contaminated soils from potential receptors through the option of on-site encapsulation of contaminated soils covered by a clay cap and select fill as part of the GCLR2 embankment. Arsenic concentrations were found to have the potential to leach from the soil matrix through simulated conditions. Consequently, the material should be placed and managed in such a way to minimise the interaction with surface water.

The encapsulation area will contain soils with contaminants exceeding the sensitive landuse criteria but generally below the commercial and industrial human health landuse criteria.

The current location of the historical ballast will be validated on relocation of the material to confirm the condition of the native soils and ensure that the area is suitable for its proposed use.

CPB Contractors will relocate the contaminated material and contaminated soils below the ballast from the surveyed locations within the Project boundary and allow the SQP to undertake validation sampling to evidence that the material has been removed. CPB Contractors will batter back and stabilise any remaining contaminated ballast at the project boundary and provide a capping treatment to the

satisfaction of the SQP to minimise the risk of surface water infiltration and migration back into the Project boundary.

On completion of the relocation activities the location of the encapsulation area will be recorded on the Department of Transport and Main Roads (TMR) asset register in order to allow ongoing management of the site. The lots will need to be notified to the DEHP and remain on the Environmental Management Register (EMR). CPB contractors will be responsible for the notification to DEHP.

It is not expected that the material will require a Site Management Plan to be developed as the material will not require ongoing maintenance or environmental monitoring due the encapsulated design and the proposed landuse as a rail corridor. The recording of the area on the EMR and the TMR asset registers is to provide a notification to planners and workers of the potential contaminated material in the event that works (drainage services) or future development or construction is undertaken.

4.2 REMEDIATION PROGRAM

This section provides a summary of the proposed remedial methods and activities that are required in order to minimise potential for future impacts from the identified soil contamination found at the site.

The overall program has been developed below and will comprise:

- Notification to DEHP of the presence of a hazardous contaminant by CPB contractors and recording of the two lots on the EMR;
- Undertaking the site works as detail within this workplan;
- Validation of the works by the SQP and preparation of a Validation report; and
- Provision of the report to TMR and DEHP for information purposes.

4.2.1 Site Clearing

Where necessary, large trees and shrubs will be cleared and stockpiled away from the remediation area. The areas that will be used for the encapsulation will be cleared and prepared for revival of the ballast.

4.2.2 Site Preparation

The area will be cleared and compacted to provide a clean level surface for the application of the plastic marker layer. Plastic marker layer with a Bidm protection layer will be rolled out on a prepared surface below the proposed embankment. The ballast will be placed on the marker layer in such a manner to a least 0.5m from the edge of the plastic/bidm.

4.2.3 Relocation of Ballast

The extent of the ballast will be clearly demarcated as indicated by the attached surveys. Once the site has been prepared, the material will be relocated using traditional earthmoving equipment and on site

transport such as Moxies as required. The material will be loaded out of its current location in a sequential fashion starting from the northern extent of the ballast and progress in a southerly direction.

The excavation will progress to allow for a minimum of 100mm to be removed from the current location and inspected by the SQP to ensure all ballast has been removed. The area will then be validated through sampling and analytical testing.

4.2.4 Placement

The ballast will be placed on the prepared surface as outlined above in 300mm lifts to a maximum height of 1.5m. The material will be placed so as to create a stable profile and allow compaction in accordance with the project's design requirements. The placed ballast will be immediately covered in a final plastic marker layer. The plastic will be fixed in place with the final cover layer encompassing the bottom marker layer to minimise the ingress of surface water. Select fill will be used to further encapsulate the ballast in accordance with the embankment design and also for a minimum of 1m coverage of select fill in all directions.

4.2.5 Locations and Documentation

The encapsulation area will be surveyed and recorded on the project design documentation and the owner's asset management register. The SQP will prepare suitable documentation to demonstrate that the material has been relocated and encapsulated in accordance with this remediation strategy.

5 OPERATIONAL CONTROL

Remedial excavation works bring with them the potential of risk to the surrounding environment, associated with remobilisation and migration of contamination off-site or within a site, as well as to local residents or site personnel. To ensure the protection of the environment and personnel health and safety, measures are required to be implemented during the excavation and upgrade works.

The excavation works will comply with relevant legislation operating in Queensland, including the *Environmental Protection Act, 1994* and the operational documents prepared for the site. The following sections outline the minimum control measures that will be required to be implemented on the site. This document presents the methodology for the implementation of environmental controls.

5.1 SEDIMENT, EROSION AND SURFACE WATER MANAGEMENT

The project's Sediment & Erosion Control Plan may be amended and implemented by the contractor to reflect the proposed works program. The sections below outline general guidelines which should assist with the operational works.

5.1.1 Contaminated Soil Work Areas

Surface water will be prevented from entering the works area by the implementation of diversion drains around the perimeter of the excavation and outside the known impacted area of the excavation. Surface water which is collected from the impact area at the site will be appropriately managed until such time as it can be assessed for appropriate disposal.

5.1.2 Runoff

Exposed and disturbed surfaces will be covered or adequately protected at all times. As discussed, runoff will be managed such that stormwater from clean areas of the site will be diverted from exposed areas, that may contain increased sediment loads.

When rain is likely or when work is not proposed to continue in a working area on the following day, precautions shall be taken to minimise ingress of excess water into contaminated material.

5.1.3 Sediment Fences and other designed and approved ESC

Sediment fences will be constructed to minimise the potential migration of sediment, primarily as surface run off to other areas of the Site. Sediment fence design will be completed as per appropriate guidelines and the project overall erosion and sediment control plan.

5.2 VEHICLE CONTROL

All plant and equipment will be inspected during the excavation works of materials to ensure that no excess contaminated soil adheres to the wheels/tracks or undercarriage or buckets. Soil on plant and equipment will be removed prior to leaving the works area. Onsite traffic movements will be restricted to specifically prepared and designated access tracks for this activity.

5.2.1 Vehicle Movement

The following operational protocols will be followed:

- All plant and equipment leaving the site will be inspected for residual contaminated soil material noted to be adhering to the wheels or undercarriage;
- The plant and equipment will then be cleaned using water jets and/or brooms, to minimise potential for soil on the plant equipment exterior to be transported off-site;
- All buckets and transport vehicles will be inspected and if required cleaned prior to use on other areas of the project.

5.3 AIR QUALITY CONTROL

The main sources of air polluting emissions from the remediation excavation works are exhaust emissions from general plant and equipment. General dust emissions may also occur during excavation of soil, stockpiling and the subsequent refilling and capping of placement areas. The following measures will be implemented:

- The remediation excavation works will consider minimisation of the size of an exposed area at any one time;
- All plant and equipment will be maintained in good working order in accordance with the manufacturers requirements to limit smoke and dust emissions;
- Where practicable dust control measures such as water sprays and dust suppressants will be used to minimise the generation of dust from the contaminated material.

5.4 PPE

The results of the monitoring shall be used to assess the appropriate level of PPE. In addition to normal protective practices required under the OH&S Act (2008) and associated legislation, all personnel must be provided with appropriate training and PPE as warranted by the conditions. The level of protection required shall be assessed by the Contractor's Responsible Officer in accordance with

Table 2.

Should atmospheric exceed Level C PPE, requirements regarding PPE and work methods will be re-evaluated.

Table 2: PPE Requirements

Level of PPE	PPE Required	Conditions
Level D	<ul style="list-style-type: none">• Hard hat/safety glasses• Long sleeve• Safety boots• Inner and outer gloves as required (Hearing protection if required)	All site works Shirt and trousers

5.4.1 Decontamination Procedures

All personnel will be provided with PPE including nitrile gloves. This will be worn when handling soil to minimise the potential for exposure to contamination. Gloves will be changed between samples to minimise the potential for cross-contamination. Any sampling equipment (trowel, shovels, augers) will

be decontaminated between samples. After removing gloves and before eating, drinking or leaving the site, personnel will wash their hands with soap and water.

5.5 CONTINGENCY PLANS

The unexpected conditions that could feasibly occur at the site include:

- The uncovering of greater amounts of ground contamination than presently estimated;
- The uncovering of presently unknown types of contamination;
- The generation of unacceptable levels of dust;
- The generation of unacceptable odours/toxic gases;
- The generation of unacceptable noise and/or vibration levels; and
- Spills and leaks of hazardous materials.

Procedures that will be used to address these contingencies are provided in the following sections.

5.6 INCREASED VOLUMES OF CONTAMINATED MATERIAL

Throughout the project, the quantity of materials encountered at the site will be monitored as part of the Materials Tracking System. In the case of a significant increase in the estimated volume of Contaminated Soils, a review of the remediation strategy will be undertaken by the SQP. Additional soils may be taken and managed as the Project ensures that all contaminated material is removed. This additional material will be managed with the relocated ballast material.

5.7 UNEXPECTED MATERIAL

The presence of unexpected materials would be highlighted during remedial works by the observation of any unusual physical / sensory characteristics of the “impacted” soils and fills, the results of visual air monitoring, and / or validation sampling.

In the event that a significant unexpected type of material is identified at the site, an assessment of the influence of the material on the Project would be undertaken. If evidence suggests that the level and extent of contamination is significantly greater than assumed, further investigation will be performed by the SQP to assess its extent. Once it is identified, the impacted soil will be managed and / or remediated.

5.8 INCREASED DUST GENERATION

Where unacceptable dust levels are considered to have been mainly generated from open areas of the site, the following actions will be taken to suppress ambient dust by:

- Increased water sprays applied by a “knocker type” spray nozzle; or
- Sheeting or cover laid over and secured to cover localised exposed areas (e.g. stockpiles).

5.9 SPILLS AND LEAKS

Contingency measures shall be implemented when spills and / or leaks of hazardous materials occur at the site. On-site contingency measures that shall be in place throughout the project to protect the surrounding community from hazards posed by chemical spills and leaks will include the presence of a spill kit on-site.

6 VALIDATION PROGRAM

6.1 VALIDATION SAMPLING PLAN

Once the excavation has reached the designed extent, validation samples will be collected from the current areas of the ballast at a rate of 1 sample per 10 linear meters.

6.2 VALIDATION CRITERIA

Epic Environmental refers to the documents that are nominated by the Project which includes the National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amendment 1, 2013) (NEPM 2013); Contaminated land assessment guideline, QLD DEHP, July 2014; Managing contaminated land under the Sustainable Planning Act 2009, Guideline, QLD DEHP, July 2014.

It is noted however that a number of the DEHP documents have been rescinded or superseded and Epic will rely primarily on the NEPM (2013) for environmental and health based investigation threshold levels for contaminant concentrations in soil. These investigation thresholds are based on the potential toxicity to receptors in different exposure settings and/or land uses.

Considering that the site will continue to be used for commercial/industrial purposes the following thresholds will apply:

- Human health for commercial industrial settings; and
- Management limits for TPH fractions F1 -F4 in soil under commercial and industrial settings.

Notwithstanding the above, soil results will also be compared with thresholds indicated for residential settings for comparative purposes, and to assess the potential for the site to remain on the Environmental Management Register (EMR).

6.2.1 Analytical Plan

The analytical suite that will be adopted will include the following analytes:

- Heavy Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn);
- TRH/BTEXN;
- PAH.

6.2.2 Laboratory Methodology

Australian Laboratory Services (ALS), a laboratory with analytical methods accredited by the National Association of Testing Authorities (NATA) will undertake the laboratory analysis. Laboratory test methods are based upon the National Environment Protection (Assessment of Site Contamination) Measure (NEPM) Schedule B (3) (2013) 'Guidelines for the Laboratory Analysis of Potentially Contaminated Soil'.

6.2.3 Sample Dispatch and Documentation

Samples will be placed in appropriately pre-treated sample jars, placed in an insulated container on ice and submitted to a NATA accredited laboratory for analysis. Sample movements will be documented using appropriate Chain of Custody forms.

6.3 3.4 QUALITY ASSURANCE PROGRAM

Quality assurance sampling will be conducted as outlined in AS4482.1-2005, namely:

- Collection and analysis of one blind replicate sample per twenty primary samples analysed (submitted to primary analysing laboratory under an individual sample name not identifiable with the primary sample);
- Collection and analysis of one split sample per twenty primary samples analysed (submitted to secondary analysing laboratory under the same sample name as the primary sample);
- One rinsate sample per day will be collected to ensure there is no cross-contamination of substances from the sampling equipment used; and
- One trip blank sample per day.

6.4 REPORTING

A brief technical report will be prepared by the SQP. The report shall document remediation and validation program activities including the results of the excavation and validation analysis. An evaluation of these results against the remedial goals and demonstrating compliance with the conditions of this RP will also be undertaken.

The report will also include the results of the QA/QC program, and copies of documentation validating the appropriate handling of contaminated soil.

Notice

Environmental Protection Act 1994

Duty to notify of environmental harm

This form is to be used for notifying the administering authority about events or changes in condition of land causing or threatening serious or material environmental harm, in accordance with the duty to notify provisions contained in sections 320 to 320G, Chapter 7 Part 1 of the Environmental Protection Act 1994 (the EP Act).

This Notice should be completed having regard to the guidance in:

- Guideline: The duty to notify of environmental harm (EM467)
- Guideline: The duty to notify for contaminated land (EM1430)

The details provided should address the nature of the event or change in condition as relevant. The notice should be completed as fully as practicable in the circumstances. Indicate any sections of the notice that are not applicable or for which information is not currently available.

If a notice is being given with respect to a notifiable activity, the notice template EM384 should be used. Circumstances could arise in which notice of a related event or change in condition of land also needs to be provided.

Office use only

Date entered in Ecotrack:		Relevant regional manager:	
Ecotrack reference number:		Date sent to regional manager:	
Relevant regional area:		Officer actioning this item:	

1. Person giving notice

NAME sch4p4(6) Person		TELEPHONE (BUSINESS HOURS) 07 3851 9030
		TELEPHONE (AFTER HOURS) sch4p4(6) Person
COMPANY/ORGANISATION NAME (IF APPLICABLE) CPB Contracting - Gold Coast Light Rail Project		
POSITION IN COMPANY/ORGANISATION (IF APPLICABLE) ENVIRONMENTAL MANAGER		
POSTAL ADDRESS 32 Industrial Avenue, Moledinar		
EMAIL	FACSIMILE	

sch4p4(6) Pdf@cpbcon.com.au

2. Who is giving notice about an event or change of condition

2.1. In what capacity are you giving notice?

Tick relevant box

- I am the owner of the land ☐
- I am an occupier (e.g. lessor or tenant) of the land ☒
- I am a representative of a local government ☐
- I am an auditor performing an auditor's function under EP Act ☐
- I am an employer ☐
- I am an employer of someone carrying out an activity ☐
- I am an employee carrying out an activity and have not been able to contact my employer ☐
- Other (specify) ☐

2.2. Please provide details of your involvement

For example, what is your involvement as an employer or employee or as a representative of a local government?

Environment Manager for the Gold Coast Light Rail Project

3. Details of the affected land where the event or change in condition has occurred

3.1. Please provide details of the lot and plan description at which the event or change in condition has taken place (and full street address if available).

NAME BY WHICH THE PROPERTY IS KNOWN INTRA-REGIONAL TRANSPORT CORRIDOR (IRTC)	
FULL STREET ADDRESS OF THE SITE NA	
ANY OTHER INFORMATION THAT WILL ASSIST IN QUICKLY LOCATING THE LOCATION WHERE AN EVENT OR ACTIVITY HAS OCCURED REFER TO THE ATTACHED SITE PLANS AND SURVEY	
LOT(S) LOT 202, LOT 3	PLAN(S) SP260950, RP887429
GRID REFERENCES NORTHING ?? EASTING ??	
LOCAL GOVERNMENT AUTHORITY CITY OF GOLD COAST	

3.2. Is a map or locality plan attached to this notification?

☐ No ☒ Yes

A map or locality plan that shows the affected land may greatly assist the processing of this notification.

3.3. Is the affected land the origin of contamination or area harmed or both?

Is the affected land (as described above) the land on which the contamination originated, caused harm (impacts) or both?

☐ Origin ☐ Harmed ☒ Both

4. Activity that has led to the event or change in condition

4.1. Nature of activity

- Is the activity a notifiable activity listed under Schedule 3 of the EP Act (if it is then use the template EM384) or another activity that has caused or may cause serious or material environmental harm? ☐ Notifiable ☒ Other
- Is the activity a resource activity? ☐ Yes ☒ No
- Is the activity currently occurring or did it occur previously? ☐ Current ☒ Previous

4.2. Describe the nature of the activity

If you require additional space attach the information on a separate sheet and make reference to that sheet here.

Rail ballast from the original Beenleigh to Southport Railway line was encountered as part of the Gold Coast Light Rail Stage 2 (GCLR2) Project. The historical ballast is believed to have been in place since the line was decommissioned in 1964. The ballast was identified following vegetation clearance and was then isolated from further activities pending assessment and management by an SQP.

4.3. State whether the primary activity that led to the event was being carried out under:

- an environmental protection policy ☐ Yes
- a transitional environmental program ☐ Yes
- an environmental protection order ☐ Yes
- an environmental authority (use EM384) ☐ Yes
- a development condition of a development approval ☐ Yes
- a prescribed condition for carrying out a small scale mining activity ☐ Yes
- an emergency direction ☐ Yes
- an accredited environmental risk management plan ☐ Yes

4.4. Please provide the identifying details of the relevant approval or authority for carrying out the activity (if known). If possible attach a copy of the relevant document.

CPB Contractors is undertaking the construction of the Project on behalf of GoldLinQ (Client) and Department of Transport and Main Roads (State).

Published on DES Disclosure Log
RTI Act 2009

5. Special requirement for resource activities (petroleum and gas, geothermal and greenhouse gas storage activities but not a mining activity)

Does this notice relate to notification of an event that has occurred while carrying out a resource activity that has:

- negatively affected, or is reasonably likely to negatively affect, the water quality of an aquifer; or ☒ No ☐ Yes
- has caused the connection of two or more aquifers ☒ No ☐ Yes

6. Nature and circumstances of how event has occurred

If it is an event involving the release of contaminants that is being notified, the following information should be provided

6.1. Describe the circumstances in which the event has occurred.

Please provide details of the circumstances that led up to the event, any factors that may make the effects of the event worse, any preventive measures or cleanup up action taken and any other matters that may be relevant. If you require additional space attach the information on a separate sheet and make reference to that sheet here.

Historical rail ballast encountered during clearing and construction activities. The area of the ballast was noted as a raised area within the proposed GCLR2 alignment. On clearing of vegetation the ballast was observed by project staff and an exclusion area established pending further assessment. CPB undertook initial sampling and testpits to determine the extent and nature of the material. It was estimated that 1500m³ of ballast is located in the GCLR2 alignment.

6.2. Provide any additional information that may be relevant to this notification of an event

If additional space is required attach the information on a separate sheet and make reference to that sheet here.

Laboratory results were provided to the appointed SQP, Brad May and assessed against relevant landuse and environmental criteria. Summary tables and laboratory results have been attached (Table T1, Table T2, ALS Report EB1621816, ALS report EB1622586).

Laboratory results indicated that elevated arsenic concentrations were detected above the sensitive landuse criteria but well below the commercial and industrial HILs.

It was determined that the most appropriate management strategy would be to manage the material on site through an isolation and containment strategy. To assess the feasibility of this approach, the SQP requested ASLP (neutral pH leach) analysis for arsenic. These results indicated that the arsenic had the potential to leach under simulated rainfall conditions and should be managed to minimise contact with surface water infiltration.

A management plan has been developed that will allow for the containment of the historical ballast within the new light rail embankment and contained within a low permeability barrier. The encapsulation area on each lot will be managed under the property owners asset management database.

6.3. Event type:

- | | | | |
|--------------------------------|------------------------------------|---|--|
| ☐ Spill | ☐ Discharge | ☐ Leakage | ☐ Exposure/uncovering |
| ☐ Fire | ☐ Fishkill | ☐ Other <u>Uncovered during clearing</u> | |

6.4. Source of release:

- | | | | |
|---|--|--|---|
| ☐ Vehicle spill | ☐ Vessel spill | ☐ Pipeline breach | ☐ Dam/pond failure |
| ☐ Drain outlet | ☐ Bulk/tank | ☐ Vessel sinking | ☐ Dumping |
| ☐ Sewage discharge | ☐ Industrial activity | ☐ Cattle/sheep dip | ☐ Horticulture |
| ☐ Excavation | ☐ Landfill | ☒ Other <u>Historical Rail Ballast</u> | |

6.5. Contaminants (if known):

- | | | | |
|---|---|---------------------------------------|--|
| ☐ Solid chemicals | ☐ Liquid chemicals | ☐ Hydrocarbons | ☐ Gas/vapour |
| ☐ Pesticide/herbicide | ☐ Nutrients | ☐ BOD/COD | ☐ Dangerous goods |
| ☒ Other <u>Heavy metals</u> | | | |

6.6. Details of contaminants (if known):

Substance(s): Arsenic contaminated rail ballast

Quantity: 1500 Litres/Kilograms/Tonnes/m3

Area/extent affected: 200 m by 10 m

7. Change in condition of land

If it is a change in the condition of land that is being notified, the following information should be provided

7.1. Nature of change in the condition of the land (that has caused or is reasonably likely to cause or involve serious or material environmental harm)

- | | | |
|---|-----------------------------|------------------------------|
| • Dispersal of contaminants in soil | ☐ No | ☐ Yes |
| • Dispersal of contaminants in groundwater | ☐ No | ☐ Yes |
| • Dispersal of contaminants in surface waters | ☐ No | ☐ Yes |
| • Accumulation of gases or vapour in soil or structures | ☐ No | ☐ Yes |
| • Change in surface features (e.g. vegetation) | ☐ No | ☐ Yes |

7.2. Details of change in the condition of the land

Describe what the change in condition involves

If additional space is required attach the information on a separate sheet and make reference to that sheet here.

7.3. Cause of change in condition (if known)?

Describe the known factors that have led to the change in condition

If additional space is required attach the information on a separate sheet and make reference to that sheet here.

7.4. Timeframe of change in condition

Outline what is known of the timeframe in which the change in condition has occurred

7.5. Type of environment affected:

What is the type of environment that has been affected by an event or change in condition?

- | | | | |
|--|--------------------------------------|--------------------------------------|-------------------------------------|
| ☐ Waterway/drain | ☐ Marine | ☐ Estuarine | ☐ Freshwater |
| ☒ Land contamination | ☐ Urban area | ☐ Air/fallout | ☐ Vegetation |
| ☐ Protected area | ☐ Other _____ | | |

8. How and when did you become aware of the event or change of condition

8.1. What was the source of information about the event or change in condition

- own observation ☒ Yes
- information provided by a person with relevant competencies ☒ Yes
- information provided by an employee ☒ Yes

8.2. When did you first became aware of the event or change in condition for which notice is given

TIME 1600	DATE 29 September 2016
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9. Details of registered owners or occupiers of affected land to which notice has been given

Note: Registered owners or occupiers of affected land do not need to be notified before notifying the administering authority.

9.1. Have any registered owners or occupiers of affected land been notified of this incident?

☐

No

☒

Yes (provide details of the occupiers and registered owners of land affected, or potentially affected, by this incident including details of how notice to those persons was given)

NAME District Director - South Coast Mr Allan Stone Queensland Department of Transport and Main Roads	TELEPHONE 07 5563 6600
POSTAL ADDRESS PO Box 442 Nerang Qld 4211	
DESCRIPTION OF HOW NOTICE WAS GIVEN Technical memo and project meetings	

If you require additional space you may attach the information on a separate sheet.

10. Declaration

Note: If you have not told the truth in this application you may be liable for prosecution under the relevant Acts or Regulations.

I do solemnly and sincerely declare that the information provided is true and correct to the best of my knowledge. I understand that it is an offence under s. 480 of the *Environmental Protection Act 1994* to give to the administering authority or an authorised person a document containing information that I know is false, misleading or incomplete in a material particular.

I understand that all information supplied on or with this application form may be disclosed publicly in accordance with the *Right to Information Act 2009* and the *Evidence Act 1977*.

NOTIFYING PERSON'S SIGNATURE	TIME / DATE
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11. Sending the written notice

Please return the completed notice to Permit and Licence Management at the Department of Environment and Heritage Protection by:

Pollution hotline 1300 130 372 Option 2

AND written notification via email, fax or registered post:

Email: <pollutionhotline@ehp.qld.gov.au>

Fax: (07) 3330 5875

Registered post:

Permit and Licence Management
Department of Environment and Heritage Protection
GPO Box 2454
Brisbane QLD 4001

Note: Include **'Duty to notify of environmental harm'** in the subject line of the fax or email and attach a completed copy of the template.

12. Phoning the pollution hotline

In addition to providing the written notice if you become aware of a matter which has caused or threatens serious or material environmental harm you should immediately call the pollution hotline on **1300 130 372 select Option 2** and report the matter. Reporting the matter through the pollution hotline allows the administering authority to take necessary measures to prevent further harm and to mitigate the effects of an incident or event.

In addition to notifying the administering authority, and where that is not the relevant local government, it is good practice to notify the local government for the area where the event has occurred.

13. Further information

The latest version of this publication can be found at www.ehp.qld.gov.au using the publication number EM468 as a search term or by contacting Permit and Licence Management on 13 QGOV (13 74 68).

Privacy statement

The Department of Environment and Heritage Protection (EHP) will use the personal information collected on this form to investigate an incident that potentially caused or threatened to cause serious or material environmental harm, as provided for under ss. 320–320G of the *Environmental Protection Act 1994*. The information will only be accessed by authorised employees within EHP. The information provided on this form will not be otherwise be used or disclosed unless required or authorised by law. For information about privacy matters email: For queries about privacy matters email: privacy@ehp.qld.gov.au or telephone: (07) 3330 5436.

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RTI Act 2009



Department of Environment and Heritage Protection (EHP)
ABN 46 640 294 485
400 George St Brisbane, Queensland 4000
GPO Box 2454 Brisbane QLD 4001 AUSTRALIA
Email: emr.clr.registry@ehp.qld.gov.au

26 October 2016

Site ID: 164800
File Number: 101/0020657
Enquiries to: emr.clr.registry@ehp.qld.gov.au

The State of Queensland Represented by
Department of Transport and Main Roads
Attn Mr Allan Stone District Director – South Coast
PO Box 442
NERANG QLD 4211

SHOW CAUSE NOTICE TO OWNER OF LAND - PROPOSAL TO INCLUDE PARTICULARS OF LAND ON THE ENVIRONMENTAL MANAGEMENT REGISTER

In accordance with section 375 of the *Environmental Protection Act 1994 (EP Act)* notice is given that particulars of the parcel of land described below are proposed for inclusion on the Environmental Management Register (EMR).

Lot: 3 Plan: RP887429
Gold Coast City Council

NAPPER ROAD
ARUNDEL QLD 4214

The Department of Environment and Heritage Protection (EHP) believes grounds exist for including particulars of the parcel of land on the EMR because notification has been received that the land has been used for the following notifiable activities or contaminated by the following hazardous contaminants. Notifiable activities are mainly industrial/commercial activities that have been known to cause contamination of land and refer to both past and current activities.

HAZARDOUS CONTAMINANT - This site has been subject to a hazardous contaminant. Refer to the summary given below.

Arsenic identified on site at concentrations exceeding the nominated HIL-A NEPM 1999.
Rail Ballast Remediation Plan Methodology prepared by Epic Environmental 13 October 2016
Technical Memo - GCLR2 - Historical Ballast prepared by Epic Environmental 29 September 2016

If an investigation of the land has been conducted and EHP holds a copy of a report prepared about the investigation, a copy of the report is attached.

As the owner of the land you may make a submission about why particulars of the land should not be included on the EMR. Submissions must be accompanied by a written declaration by the owner that the owner:

- (i) has not knowingly included any false or misleading information in the submission; and
- (ii) has given all relevant information to the authority.

Submissions must be received no later than Wednesday, 7 December 2016.

After this date, if no submission has been received from the owner, particulars of the land will be recorded on the EMR. However, if you wish the particulars to be recorded earlier, you may advise in writing that you do not intend to make a submission.

With the issuing of this show cause notice under section 375, the following requirement applies under section 408 of the *EP Act*:

The owner must before agreeing to dispose of the land to someone else (the buyer), give written notice to the buyer stating that the land is the subject of a show cause notice under section 375.

For further information about contaminated land matters visit www.qld.gov.au, and search for "contaminated land".

sch4p4(6) Personal in

Kelly Gleeson
Manager – (Assessment) Industry & Development
BRISBANE

Delegate of Administering Authority
Environmental Protection Act 1994



Department of Environment and Heritage Protection (EHP)
ABN 46 640 294 485
400 George St Brisbane, Queensland 4000
GPO Box 2454 Brisbane QLD 4001 AUSTRALIA
Email: emr.clr.registry@ehp.qld.gov.au

26 October 2016

Site ID: 164799
File Number: 101/0020657
Enquiries to: emr.clr.registry@ehp.qld.gov.au

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Department of Transport and Main Roads
Attn Mr Allan Stone District Director – South Coast
PO Box 442
NERANG QLD 4211

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In accordance with section 375 of the *Environmental Protection Act 1994 (EP Act)* notice is given that particulars of the parcel of land described below are proposed for inclusion on the Environmental Management Register (EMR).

Lot: 202 Plan: SP260950
Gold Coast City Council

COUNTRY CLUB DRIVE
HELENSVALE QLD 4212

The Department of Environment and Heritage Protection (EHP) believes grounds exist for including particulars of the parcel of land on the EMR because notification has been received that the land has been used for the following notifiable activities or contaminated by the following hazardous contaminants. Notifiable activities are mainly industrial/commercial activities that have been known to cause contamination of land and refer to both past and current activities.

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Enquiries to: emr.clr.registry@ehp.qld.gov.au

The Chief Executive Officer
Gold Coast City Council
PO Box 5042
GOLD COAST MC QLD 9729

NOTICE OF LAND LISTED ON THE ENVIRONMENTAL MANAGEMENT REGISTER

In accordance with section 378 of the *Environmental Protection Act 1994 (EP Act)* notice is given that the parcel of land described below has been listed on the Environmental Management Register (EMR).

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The parcel of land has been recorded on the EMR as, after careful consideration of any submissions, it is decided that the land has been affected by a hazardous contaminant.

HAZARDOUS CONTAMINANT

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Kelly Gleeson
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Technical Memo - GCLR2 - Historical Ballast prepared by Epic Environmental 29 September 2016

The owner may apply for a review of the decision to record the land in the EMR within 10 business days after receipt of this notice, in accordance with section 521 of the *EP Act*. If you decide to apply for a review you must, in accordance with section 521(3) also give notice to the local government that you are seeking a review. You must forward to the local government the following documents:

- a notice of the application (the "review notice");
- a copy of the application and supporting documents.

The review notice must inform the local government that submissions on the application may be made within 5 business days after the application is made to the Department of Environment and Heritage Protection, as required by section 521(4) of the *EP Act*. A land owner dissatisfied with a review decision may appeal against the decision in accordance with section 531 of the *EP Act*.

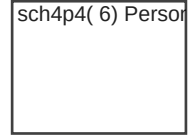
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The owner must, before agreeing to dispose of the land to someone else (the buyer), give written notice to

the buyer stating that the particulars of the land have been recorded in the register and, if details of a site management plan for the land are recorded in the register, details of the plan.

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sch4p4(6) Personal inform

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Manager – (Assessment) Industry & Development
BRISBANE

Delegate of Administering Authority
Environmental Protection Act 1994

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Notice

Environmental Protection Act 1994

Duty to notify of environmental harm

This form is to be used for notifying the administering authority about events or changes in condition of land causing or threatening serious or material environmental harm, in accordance with the duty to notify provisions contained in sections 320 to 320G, Chapter 7 Part 1 of the Environmental Protection Act 1994 (the EP Act).

This Notice should be completed having regard to the guidance in:

- Guideline: The duty to notify of environmental harm (EM467)
- Guideline: The duty to notify for contaminated land (EM1430)

The details provided should address the nature of the event or change in condition as relevant. The notice should be completed as fully as practicable in the circumstances. Indicate any sections of the notice that are not applicable or for which information is not currently available.

If a notice is being given with respect to a notifiable activity, the notice template EM384 should be used. Circumstances could arise in which notice of a related event or change in condition of land also needs to be provided.

Office use only

Date entered in Ecotrack:		Relevant regional manager:	
Ecotrack reference number:		Date sent to regional manager:	
Relevant regional area:		Officer actioning this item:	

1. Person giving notice

NAME sch4p4(6) Pers		TELEPHONE (BUSINESS HOURS) 07 3851 9030	
		TELEPHONE (AFTER HOURS) sch4p4(6) Perso	
COMPANY/ORGANISATION NAME (IF APPLICABLE) CPB Contracting - Gold Coast Light Rail Project			
POSITION IN COMPANY/ORGANISATION (IF APPLICABLE) ENVIRONMENTAL MANAGER			
POSTAL ADDRESS 32 Industrial Avenue, Moledinar			
EMAIL		FACSIMILE	

sch4p4(6) Pe@cpbcon.com.au

2. Who is giving notice about an event or change of condition

2.1. In what capacity are you giving notice?

Tick relevant box

- I am the owner of the land ☐
- I am an occupier (e.g. lessor or tenant) of the land ☒
- I am a representative of a local government ☐
- I am an auditor performing an auditor's function under EP Act ☐
- I am an employer ☐
- I am an employer of someone carrying out an activity ☐
- I am an employee carrying out an activity and have not been able to contact my employer ☐
- Other (specify) ☐

2.2. Please provide details of your involvement

For example, what is your involvement as an employer or employee or as a representative of a local government?

Environment Manager for the Gold Coast Light Rail Project

3. Details of the affected land where the event or change in condition has occurred

3.1. Please provide details of the lot and plan description at which the event or change in condition has taken place (and full street address if available).

NAME BY WHICH THE PROPERTY IS KNOWN INTRA-REGIONAL TRANSPORT CORRIDOR (IRTC)	
FULL STREET ADDRESS OF THE SITE NA	
ANY OTHER INFORMATION THAT WILL ASSIST IN QUICKLY LOCATING THE LOCATION WHERE AN EVENT OR ACTIVITY HAS OCCURED REFER TO THE ATTACHED SITE PLANS AND SURVEY	
LOT(S) LOT 202, LOT 3	PLAN(S) SP260950, RP887429
GRID REFERENCES NORTHING ?? EASTING ??	
LOCAL GOVERNMENT AUTHORITY CITY OF GOLD COAST	

3.2. Is a map or locality plan attached to this notification?

☐ No ☒ Yes

A map or locality plan that shows the affected land may greatly assist the processing of this notification.

3.3. Is the affected land the origin of contamination or area harmed or both?

Is the affected land (as described above) the land on which the contamination originated, caused harm (impacts) or both?

☐ Origin ☐ Harmed ☒ Both

4. Activity that has led to the event or change in condition

4.1. Nature of activity

- Is the activity a notifiable activity listed under Schedule 3 of the EP Act (if it is then use the template EM384) or another activity that has caused or may cause serious or material environmental harm? ☐ Notifiable ☒ Other
- Is the activity a resource activity? ☐ Yes ☒ No
- Is the activity currently occurring or did it occur previously? ☐ Current ☒ Previous

4.2. Describe the nature of the activity

If you require additional space attach the information on a separate sheet and make reference to that sheet here.

Rail ballast from the original Beenleigh to Southport Railway line was encountered as part of the Gold Coast Light Rail Stage 2 (GCLR2) Project. The historical ballast is believed to have been in place since the line was decommissioned in 1964. The ballast was identified following vegetation clearance and was then isolated from further activities pending assessment and management by an SQP.

4.3. State whether the primary activity that led to the event was being carried out under:

- an environmental protection policy ☐ Yes
- a transitional environmental program ☐ Yes
- an environmental protection order ☐ Yes
- an environmental authority (use EM384) ☐ Yes
- a development condition of a development approval ☐ Yes
- a prescribed condition for carrying out a small scale mining activity ☐ Yes
- an emergency direction ☐ Yes
- an accredited environmental risk management plan ☐ Yes

4.4. Please provide the identifying details of the relevant approval or authority for carrying out the activity (if known). If possible attach a copy of the relevant document.

Notice
Duty to notify of environmental harm

CPB Contractors is undertaking the construction of the Project on behalf of GoldLinQ (Client) and Department of Transport and Main Roads (State).

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5. Special requirement for resource activities (petroleum and gas, geothermal and greenhouse gas storage activities but not a mining activity)

Does this notice relate to notification of an event that has occurred while carrying out a resource activity that has:

- negatively affected, or is reasonably likely to negatively affect, the water quality of an aquifer; or ☒ No ☐ Yes
- has caused the connection of two or more aquifers ☒ No ☐ Yes

6. Nature and circumstances of how event has occurred

If it is an event involving the release of contaminants that is being notified, the following information should be provided

6.1. Describe the circumstances in which the event has occurred.

Please provide details of the circumstances that led up to the event, any factors that may make the effects of the event worse, any preventive measures or clean up action taken and any other matters that may be relevant. If you require additional space attach the information on a separate sheet and make reference to that sheet here.

Historical rail ballast encountered during clearing and construction activities. The area of the ballast was noted as a raised area within the proposed GCLR2 alignment. On clearing of vegetation the ballast was observed by project staff and an exclusion area established pending further assessment. CPB undertook initial sampling and testpits to determine the extent and nature of the material. It was estimated that 1500m³ of ballast is located in the GCLR2 alignment.

6.2. Provide any additional information that may be relevant to this notification of an event

If additional space is required attach the information on a separate sheet and make reference to that sheet here.

Laboratory results were provided to the appointed SQP, Brad May and assessed against relevant land use and environmental criteria. Summary tables and laboratory results have been attached (Table T1, Table T2, ALS Report EB1621816, ALS report EB1622586).

Laboratory results indicated that elevated arsenic concentrations were detected above the sensitive land use criteria but well below the commercial and industrial HILs.

It was determined that the most appropriate management strategy would be to manage the material on site through an isolation and containment strategy. To assess the feasibility of this approach, the SQP requested ASLP (neutral pH leach) analysis for arsenic. These results indicated that the arsenic had the potential to leach under simulated rainfall conditions and should be managed to minimise contact with surface water infiltration.

A management plan has been developed that will allow for the containment of the historical ballast within the new light rail embankment and contained within a low permeability barrier. The encapsulation area on each lot will be managed under the property owners asset management database.

6.3. Event type:

- | | | | |
|--------------------------------|------------------------------------|---|--|
| ☐ Spill | ☐ Discharge | ☐ Leakage | ☐ Exposure/uncovering |
| ☐ Fire | ☐ Fishkill | ☐ Other <u>Uncovered during clearing</u> | |

6.4. Source of release:

- | | | | |
|---|--|--|---|
| ☐ Vehicle spill | ☐ Vessel spill | ☐ Pipeline breach | ☐ Dam/pond failure |
| ☐ Drain outlet | ☐ Bulk/tank | ☐ Vessel sinking | ☐ Dumping |
| ☐ Sewage discharge | ☐ Industrial activity | ☐ Cattle/sheep dip | ☐ Horticulture |
| ☐ Excavation | ☐ Landfill | ☒ Other <u>Historical Rail Ballast</u> | |

6.5. Contaminants (if known):

- | | | | |
|---|---|---------------------------------------|--|
| ☐ Solid chemicals | ☐ Liquid chemicals | ☐ Hydrocarbons | ☐ Gas/vapour |
| ☐ Pesticide/herbicide | ☐ Nutrients | ☐ BOD/COD | ☐ Dangerous goods |
| ☒ Other <u>Heavy metals</u> | | | |

6.6. Details of contaminants (if known):

Substance(s): Arsenic contaminated rail ballast

Quantity: 1500 Litres/Kilograms/Tonnes/m3

Area/extent affected: 200 m by 10 m

7. Change in condition of land

If it is a change in the condition of land that is being notified, the following information should be provided

7.1. Nature of change in the condition of the land (that has caused or is reasonably likely to cause or involve serious or material environmental harm)

- | | | |
|---|-----------------------------|------------------------------|
| • Dispersal of contaminants in soil | ☐ No | ☐ Yes |
| • Dispersal of contaminants in groundwater | ☐ No | ☐ Yes |
| • Dispersal of contaminants in surface waters | ☐ No | ☐ Yes |
| • Accumulation of gases or vapour in soil or structures | ☐ No | ☐ Yes |
| • Change in surface features (e.g. vegetation) | ☐ No | ☐ Yes |

7.2. Details of change in the condition of the land

Describe what the change in condition involves

If additional space is required attach the information on a separate sheet and make reference to that sheet here.

7.3. Cause of change in condition (if known)?

Describe the known factors that have led to the change in condition

If additional space is required attach the information on a separate sheet and make reference to that sheet here.

7.4. Timeframe of change in condition

Outline what is known of the timeframe in which the change in condition has occurred

7.5. Type of environment affected:

What is the type of environment that has been affected by an event or change in condition?

- | | | | |
|--|--------------------------------------|--------------------------------------|-------------------------------------|
| ☐ Waterway/drain | ☐ Marine | ☐ Estuarine | ☐ Freshwater |
| ☒ Land contamination | ☐ Urban area | ☐ Air/fallout | ☐ Vegetation |
| ☐ Protected area | ☐ Other _____ | | |

8. How and when did you become aware of the event or change of condition

8.1. What was the source of information about the event or change in condition

- own observation ☒ Yes
- information provided by a person with relevant competencies ☒ Yes
- information provided by an employee ☒ Yes

8.2. When did you first became aware of the event or change in condition for which notice is given

TIME 1600	DATE 29 September 2016
--------------	---------------------------

9. Details of registered owners or occupiers of affected land to which notice has been given

Note: Registered owners or occupiers of affected land do not need to be notified before notifying the administering authority.

9.1. Have any registered owners or occupiers of affected land been notified of this incident?

☐

No

☒

Yes (provide details of the occupiers and registered owners of land affected, or potentially affected, by this incident including details of how notice to those persons was given)

NAME	TELEPHONE
POSTAL ADDRESS	
DESCRIPTION OF HOW NOTICE WAS GIVEN technical memo and project meetings	

If you require additional space you may attach the information on a separate sheet.

10. Declaration

Note: If you have not told the truth in this application you may be liable for prosecution under the relevant Acts or Regulations.

I do solemnly and sincerely declare that the information provided is true and correct to the best of my knowledge. I understand that it is an offence under s. 480 of the *Environmental Protection Act 1994* to give to the administering authority or an authorised person a document containing information that I know is false, misleading or incomplete in a material particular.

I understand that all information supplied on or with this application form may be disclosed publicly in accordance with the *Right to Information Act 2009* and the *Evidence Act 1977*.

NOTIFYING PERSON	sch4p4(6) Personal information	TIME / DATE 14.10.2016
------------------	---------------------------------	---------------------------

11. Sending the written notice

Please return the completed notice to Permit and Licence Management at the Department of Environment and Heritage Protection by:

Pollution hotline 1300 130 372 Option 2

AND written notification via email, fax or registered post:

Email: <pollutionhotline@ehp.qld.gov.au>

Fax: (07) 3330 5875

Note: Include 'Duty to notify of environmental harm' in the subject line of the fax or email and attach a completed copy of the template.

Registered post:

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Department of Environment and Heritage Protection
GPO Box 2454
Brisbane QLD 4001

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13. Further information

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RTI Act 2009

Technical Memo

To: CPB Contractors	From: Brad May	Attention: sch4p4(6) Person
Email: sch4p4(6) Per@cpbcon.com.au		
Project No: B160216.01	Date: 29 September 2016	
Subject: GCLR2 - Historical Ballast.		

sch4p4(6)

Epic Environmental has been engaged by CPB to assist with contaminated land matters as part of the Gold Coast Light Rail Stage 2 Project. Outlined below is a summary of the analytical results from the sampling undertaken by CPB from historical rail ballast encountered within the GCLR2 alignment to the north and south of Coombabah Creek. The purpose of this Technical Memo is to summarise the laboratory results and develop and approach to develop a management approach for the material.

The historical ballast was encountered following the initial vegetation clearing of the area. It is believed that the ballast is a remnant of the original Beenleigh to Southport line that was decommissioned in 1964. The volume and location of historical ballast located at the two separate areas has been surveyed by CPB as indicated below:

- Lot 202/SP260950 (Chainage 13973 to 14160) - Volume: 1,061.16 m³
- Lot 3 RP 887429 (Chainage 15020 – 15120) - Volume: 445.17 m³

CPB field staff collected samples from the Ballast on 2 September 2016 across the ballast profile and submitted 33 samples for laboratory analysis. The laboratory analysis included:

- Heavy Metal;
- Pesticides,
- Polychlorinated byphenols;
- Polynuclear Aromatic hydrocarbons
- Total Recoverable Hydrocarbons;
- Phenols; and
- Benzene, Toluene, Ethylbenzene, Xylene, Naphthalene.

Epic reviewed the laboratory information and requested that further analysis to be conducted to include eight samples for asbestos and eight samples for a neutral leach (deionised water) specifically for arsenic. The purpose of the neutral leach assessment was to determine if the arsenic concentrations identified in the ballast was leachable under simulated natural rainfall conditions.

Results Summary

The results from the initial laboratory analysis returned elevated concentrations for arsenic and total recoverable hydrocarbons (TRH). The elevated TRH results were however only marginally above the Ecological Screening Levels (ESL) for urban residential and open space with only one sample returning a result above Health Screen Levels (HSL) - A residential landuse.

The arsenic concentrations however exceeded the HSL-A residential criteria in 17 of the 33 samples analysed with 16 samples also exceeding the ESL for Commercial and Industrial landuse. The results have been summarised on the attached **Table T1** and **Table T2**.

The subsequent neutral leaching potential analysis for requested arsenic returned results that indicated leachable concentrations ranging from <0.01ug/L to 1.14ug/L with seven of the eight samples submitted returning arsenic above the level of reporting.

Management Approach

Current best practise approach for management within existing Lot/Plan would see management within the embankment/formation of the new works as the immediate area will require imported fill for construction. The elevated arsenic concentrations identified above the sensitive landuse criteria (HSL-A and ESLs) and the demonstrated leaching potential of arsenic in the ballast will require management measures to be adopted to allow reuse within the embankment. CPB have identified predominately heavy clays as the dominate soil type in the vicinity of the ballast that may have limited arsenic migration to date.

The attached plans indicate a typical cross section and long section for the embankment. As indicated the intention is to encapsulate the historical ballast within the embankment that will provide sufficient cover to limit surface water interaction therefore minimising the potential for arsenic migration and exposure to future users for the site. In addition to a minimum 1.5m of cover layer in all directions, it is recommended that the historical ballast is also covered with an impermeable marker layer (builders plastic/HDPE) to further limit surface water infiltration and to provide an indication of the material location.

The historical ballast is currently located within the same lot and plan and should not be relocated across the lot boundaries. As contaminants have been identified at the site above the sensitive landuse criteria, a formal notification to DEHP will be required by the site owner and placement of the lot on the EMR.

At a minimum, the owner of the site should also identify the encapsulation area within the asset management system to allow for effective future management in the event that the material will be

uncovered through future works such as installation of services. CPB will undertake full survey detail of the encapsulation extents.

Further Actions

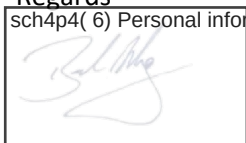
The following actions are recommended to allow the material to be reused on site:

- The owner of the site is to notify DEHP under Section 320 of the EP Act;
- Allowance in the design to accommodate the material with a minimum of 1.5m coverage and suitable barrier layer installed once placed;
- Over excavation of the current ballast areas by 200mm to ensure all ballast had been relocated;
- The current location of the ballast is inspected once the ballast has been relocated to ensure all material has been removed and validation samples collected; and
- Provide a brief close out report that describes the location of the material and summarises the works undertaken.

Please do not hesitate to contact me if you require further clarification.

Regards

sch4p4(6) Personal info



Brad May

Principal Environmental Engineer

Attachments:

Table T1, Table T2, ALS Report EB1621816, ALS report EB1622586, Concept Drawings, Location Plans

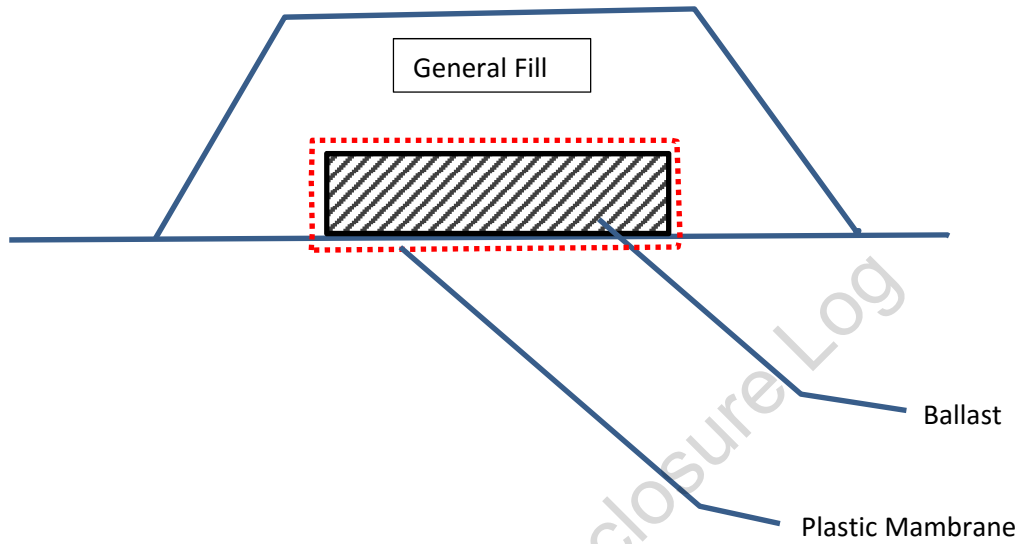


Table T1: Soil Analytical Results - EILs and HILs

Sample Date	Sample Duplicate	Sample Number	Sample Depth (m)	Material Type	Asbestos	PAH				Phenols				PCB	Cyanide (total)	Organics (mg/kg)					Pesticides					Inorganics (mg/kg)							
					Asbestos (Presence / Absence)	Total	Benzo (a) pyrene	Benzo (a) pyrene TEQ	Phenol	Pentachloro phenol	Cresols	DDT	Aldrin & Dieldrin			Chlordane	Endosulfan	Endrin	Heptachlor	HCB	Methoxychlor	Chlorpyrifos	Metals										
						As	Cd	Total Cr*															Cu	Pb	Hg [†]	Ni	Zn						
Background Levels					-	0.95-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2-30	0.04-2	0.5-110	1-190	<2-200	0.001-0.1	2-400	2-180				
NEPM EIL - Urban Residential and Public Open Space (mg/kg)					-	-	0.7 0.7 [#]	-	-	-	-	-	180	-	-	-	-	-	-	-	100	-	190-400** (190)	60-800* (190)	1,100*	-	30-560* (270)	70-1,300* (400)					
NEPM EIL - Commercial and Industrial (mg/kg)					-	-	1.4 1.4 [#]	-	-	-	-	-	640	-	-	-	-	-	-	160	-	310-660**	85-1,200*	1,800*	-	55-960*	110-2,000*						
NEPM HIL-A - Low Density Residential (mg/kg)					NAD [†]	300	-	3	3,000	100	400	1	250	240	6	50	270	10	6	10	300	160	100	20	100	6,000	300	40	400	7,400			
NEPM HIL-B - High Density Residential (mg/kg)					-	400	-	4	45,000	130	4,700	1	300	600	10	90	400	20	10	15	500	340	500	150	500	30,000	1,200	120	1,200	60,000			
NEPM HIL-C - Developed Open-space (mg/kg)					-	300	-	3	40,000	120	4,000	1	240	400	10	70	340	20	10	10	400	250	300	90	300	17,000	600	80	1,200	30,000			
NEPM HIL-D - Commercial/Industrial (mg/kg)					-	4,000	-	40	240,000	660	25,000	7	1,500	3,600	45	530	2,000	100	50	80	2,500	2,000	3,000	900	3,600	240,000	1,500	730	6,000	400,000			
Landfill Criteria - Unlined (mg/kg)					-	500	-	-	100	-	-	-	-	5	5	5	-	-	5	-	-	200	40	240,000	2,000	600	30	600	14,000				
Landfill Criteria - Maximum (mg/kg)					-	1,000	-	-	250	-	-	50	-	50	50	50	-	-	50	-	-	-	-	-	-	-	-	-	-				
Laboratory Level of Reporting (mg/kg)					YES/NAD	1.55	0.5	0.5	0.5	2	1.0	0.7	1	0.3	0.2	0.1	0.3	0.2	0.2	0.1	0.1	0.2	5	1	2	5	5	0.1	2	5			
25-Jul-16	-	A60 SS01	0.0	Soil	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	282	<1	3	28	34	<0.1	4	135					
25-Jul-16	-	A60 SS02	0.0	Soil	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	286	<1	7	32	27	<0.1	3	112					
25-Jul-16	-	A60 SS03	0.0	Soil	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	178	<1	4	26	34	<0.1	5	101					
25-Jul-16	-	A60 SS04	0.0	Soil	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	6	<1	3	<5	11	<0.1	<2	7					
25-Jul-16	-	A60 SS05	0.0	Soil	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	<5	<1	6	<5	8	<0.1	2	11					
25-Jul-16	-	A60 SS06	0.0	Soil	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	166	<1	3	23	28	<0.1	3	109					
25-Jul-16	-	A60 SS07	0.0	Soil	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	92	<1	4	26	41	<0.1	4	43					
25-Jul-16	-	A60 SS08	0.0	Soil	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	55	<1	3	10	36	<0.1	<2	35					
19-Aug-16	-	1A - Surface	0.0	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	481	<1	9	31	44	<0.1	4	22			
19-Aug-16	-	1B - 1m deep	1.0	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	<5	<1	6	6	<0.1	<2	<5				
19-Aug-16	-	2A - Surface	0.0	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	143	<1	6	24	19	<0.1	<2	96			
19-Aug-16	-	2B - 300mm	0.3	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	133	<1	3	13	17	<0.1	<2	38			
19-Aug-16	-	2C - 350mm	0.35	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	112	<1	9	10	8	<0.1	<2	<5			
19-Aug-16	-	3B - 300mm	0.3	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	147	<1	11	17	25	<0.1	4	17			
19-Aug-16	-	3C - 400mm	0.4	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	6	<1	<2	<5	7	<0.1	<2	<5			
19-Aug-16	-	3D - 500m	0.5	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	<5	<1	3	<5	8	<0.1	<2	<5			
19-Aug-16	-	4A - Surface	0.0	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	36	<1	3	10	14	<0.1	<2	21			
19-Aug-16	-	5A - Surface	0.0	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	27	<1	2	<5	10	<0.1	<2	6			
19-Aug-16	-	6A - 200m	0.2	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	<5	<1	6	<5	17	<0.1	<2	5			
19-Aug-16	-	7A - surface	0.0	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	258	<1	10	32	34	<0.1	18	118			
19-Aug-16	-	7B - 500mm	0.5	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	168	<1	10	19	22	<0.1	7	38			
19-Aug-16	-	7C - 750mm	0.75	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	<5	<1	4	<5	8	<0.1	<2	<5			
19-Aug-16	-	8A - Surface	0.0	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	376	<1	4	37	33	<0.1	5	126			
19-Aug-16	-	8B - 300mm	0.3	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	175	<1	4	32	37	<0.1	5	107			
19-Aug-16	-	8C - 500mm	0.5	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	<5	<1	<2	<5	<5	<0.1	<2	<5			
19-Aug-16	-	9A - Surface	0.0	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	250	<1	5	30	56	<0.1	5	112			
19-Aug-16	-	9B - 300mm	0.3	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	254	<1	<2	19	14	<0.1	<2	146			
19-Aug-16	-	9C - 500mm	0.5	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	430	<1	5	47	62	<0.1	7	77			
19-Aug-16	-	9D - 750mm	0.75	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	223	<1	3	76	24	<0.1	8	122			
19-Aug-16	-	10A - Surface	0.0	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	18	<1	6	<5	10	<0.1	<2	<5			
19-Aug-16	-	10B - 500mm	0.5	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	5	<1	3	<5	6	<0.1	<2	6			
19-Aug-16	-	10C - 750mm	0.75	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	7	<1	4	<5	10	<0.1	<2	6			
19-Aug-16	-	10 - Side Sample	0.0	Soil	-	<8	<0.5	<1.2	<0.5	<2	<1.5	<0.1	-	<0.3	<0.1	<0.1	<0.15	<0.15	<0.1	<0.05	<0.05	<0.1	100	<1	6	22	31	0.1	5	76			

NOTES:
1 Analyte exceeds the generic EIL Guideline Criteria for Urban Residential and Public Open Space or Commercial and Industrial Land Use
1 Analyte exceeds the HIL-A Guideline Criteria
1 Analyte exceeds the HIL-B Guideline Criteria
1 Analyte exceeds the HIL-D Guideline Criteria
1 Adopted Clean Fill Criteria for unrestricted use of soils
† Inorganic Mercury
* Criteria for Cr (VI)
^ Criteria for Cr (III)
Ecological Screening Levels (ESLs) for benzo(a)pyrene for coarse | fine soils
* Generic Added Contaminant Level (ACL), ranges provided for ACLs dependent on physicochemical properties
(190) Adopted ACL based on typical physico

Table T2: Soil Analytical Results - ESLs and HSLs

Sample Date	Sample Duplicate	Sample Number	Sample Depth (m)	Material Type	Organics (mg/kg)						BTEXN				
					C ₆ -C ₁₀ minus BTEX (F1)	C ₆ -C ₁₀	>C ₁₀ -C ₁₆ minus naphthalene (F2)	>C ₁₀ -C ₁₆	>C ₁₆ -C ₃₄	>C ₃₄	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
Soil Saturation Concentration (Csat) - Sand Silt Clay					950 910 850	950 910 850	560 570 560	560 570 560	-	-	360 440 430	560 640 630	64 69 68	300 330 330	9 10 10
ESL (Urban Residential & Public Open Space) - Coarse Fine					180 180	-	-	120 120	300 1,300	2,800 5,600	50 65	85 105	70 125	105 45	170^
ESL (Commercial/Industrial) - Coarse Fine					215 215	-	-	170 170	1,700 2,500	3,300 6,600	75 95	135 135	165 185	180 95	370^
Management Limit (Residential, parkland & public open space) - Coarse Soil Fine Soil					-	700 800	-	1,000 1,000	2,500 3,500	10,000 10,000	-	-	-	-	-
Management Limit (Commercial & Industrial) - Coarse Soil Fine Soil					-	700 800	-	1,000 1,000	3,500 5,000	10,000 10,000	-	-	-	-	-
HSL-A & HSL-B (Low - High Density Residential) Vapour Intrusion - 0m to <1m - Sand Silt Clay					45 40 50	-	110 230 280	-	-	-	0.5 0.6 0.7	160 390 480	55 NL NL	40 95 110	3 4 5
HSL-A & HSL-B (Low - High Density Residential) Vapour Intrusion - 1m to <2m - Sand Silt Clay					70 65 90	-	240 NL NL	-	-	-	0.5 0.7 1	220 NL NL	NL NL NL	60 210 310	NL NL NL
HSL-A & HSL-B (Low - High Density Residential) Vapour Intrusion - 2m to <4m - Sand Silt Clay					110 100 150	-	440 NL NL	-	-	-	0.5 1 2	310 NL NL	NL NL NL	95 NL NL	NL NL NL
HSL-A & HSL-B (Low - High Density Residential) Vapour Intrusion - 4m + - Sand Silt Clay					200 190 290	-	NL NL NL	-	-	-	0.5 2 3	540 NL NL	NL NL NL	170 NL NL	NL NL NL
HSL-C (Recreational/Open Space) Vapour Intrusion - 0m to <1m - Sand Silt Clay					NL NL NL	-	NL NL NL	-	-	-	NL NL NL	NL NL NL	NL NL NL	NL NL NL	NL NL NL
HSL-C (Recreational/Open Space) Vapour Intrusion - 1m to <2m - Sand Silt Clay					NL NL NL	-	NL NL NL	-	-	-	NL NL NL	NL NL NL	NL NL NL	NL NL NL	NL NL NL
HSL-C (Recreational/Open Space) Vapour Intrusion - 2m to <4m - Sand Silt Clay					NL NL NL	-	NL NL NL	-	-	-	NL NL NL	NL NL NL	NL NL NL	NL NL NL	NL NL NL
HSL-C (Recreational/Open Space) Vapour Intrusion - 4m + - Sand Silt Clay					NL NL NL	-	NL NL NL	-	-	-	NL NL NL	NL NL NL	NL NL NL	NL NL NL	NL NL NL
HSL-D (Commercial/Industrial) Vapour Intrusion - 0m to <1m - Sand Silt Clay					260 250 310	-	NL NL NL	-	-	-	3 4 4	NL NL NL	NL NL NL	230 NL NL	NL NL NL
HSL-D (Commercial/Industrial) Vapour Intrusion - 1m to <2m - Sand Silt Clay					370 360 480	-	NL NL NL	-	-	-	3 4 6	NL NL NL	NL NL NL	NL NL NL	NL NL NL
HSL-D (Commercial/Industrial) Vapour Intrusion - 2m to <4m - Sand Silt Clay					630 590 NL	-	NL NL NL	-	-	-	3 6 9	NL NL NL	NL NL NL	NL NL NL	NL NL NL
HSL-D (Commercial/Industrial) Vapour Intrusion - 4m + - Sand Silt Clay					NL NL NL	-	NL NL NL	-	-	-	3 10 20	NL NL NL	NL NL NL	NL NL NL	NL NL NL
Adopted Clean Fill Criteria					40	700	110	120	300	2,800	0.5	85	55	40	3
Landfill Criteria - Unlined (mg/kg)					-	500*	-	5,000*	10,000*	10,000*	10	500	300	250	-
Landfill Criteria - Maximum (mg/kg)					-	1,000*	-	10,000*	50,000*	50,000*	20	1,000	600	500	-
Laboratory Level of Reporting (mg/kg)					10	10	50	50	100	100	0.2	0.5	1	0.3	1
25-Jul-16	-	A60 SS01	0.0	Soil	<10	<10	60	60	260	110	<0.2	<0.5	<0.5	<1	<1
25-Jul-16	-	A60 SS02	0.0	Soil	<10	<10	<50	<50	130	<100	<0.2	<0.5	<0.5	<1	<1
25-Jul-16	-	A60 SS03	0.0	Soil	<10	<10	210	210	460	160	<0.2	<0.5	<0.5	<1	<1
25-Jul-16	-	A60 SS04	0.0	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
25-Jul-16	-	A60 SS05	0.0	Soil	<10	<10	<50	<50	120	<100	<0.2	<0.5	<0.5	<1	<1
25-Jul-16	-	A60 SS06	0.0	Soil	<10	<10	<50	<50	110	<100	<0.2	<0.5	<0.5	<1	<1
25-Jul-16	-	A60 SS07	0.0	Soil	<10	<10	<50	<50	200	100	<0.2	<0.5	<0.5	<1	<1
25-Jul-16	-	A60 SS08	0.0	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	1A - Surface	0.0	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	1B - 1m deep	1.0	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	2A - Surface	0.0	Soil	<10	<10	<50	<50	120	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	2B - 300mm	0.3	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	2C - 350mm	0.35	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	3B - 300mm	0.3	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	3C - 400mm	0.4	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	3D - 500m	0.5	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	4A - Surface	0.0	Soil	<10	<10	60	60	340	310	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	5A - Surface	0.0	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	6A - 200m	0.2	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	7A - surface	0.0	Soil	<10	<10	<50	<50	210	110	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	7B - 500mm	0.5	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	7C - 750mm	0.75	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	8A - Surface	0.0	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	8B - 300mm	0.3	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	8C - 500mm	0.5	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	9A - Surface	0.0	Soil	<10	<10	<50	<50	340	110	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	9B - 300mm	0.3	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	9C - 500mm	0.5	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	9D - 750mm	0.75	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	10A - Surface	0.0	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	10B - 500mm	0.5	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	10C - 750mm	0.75	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	10 - Side Sample	0.0	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1

NOTES:

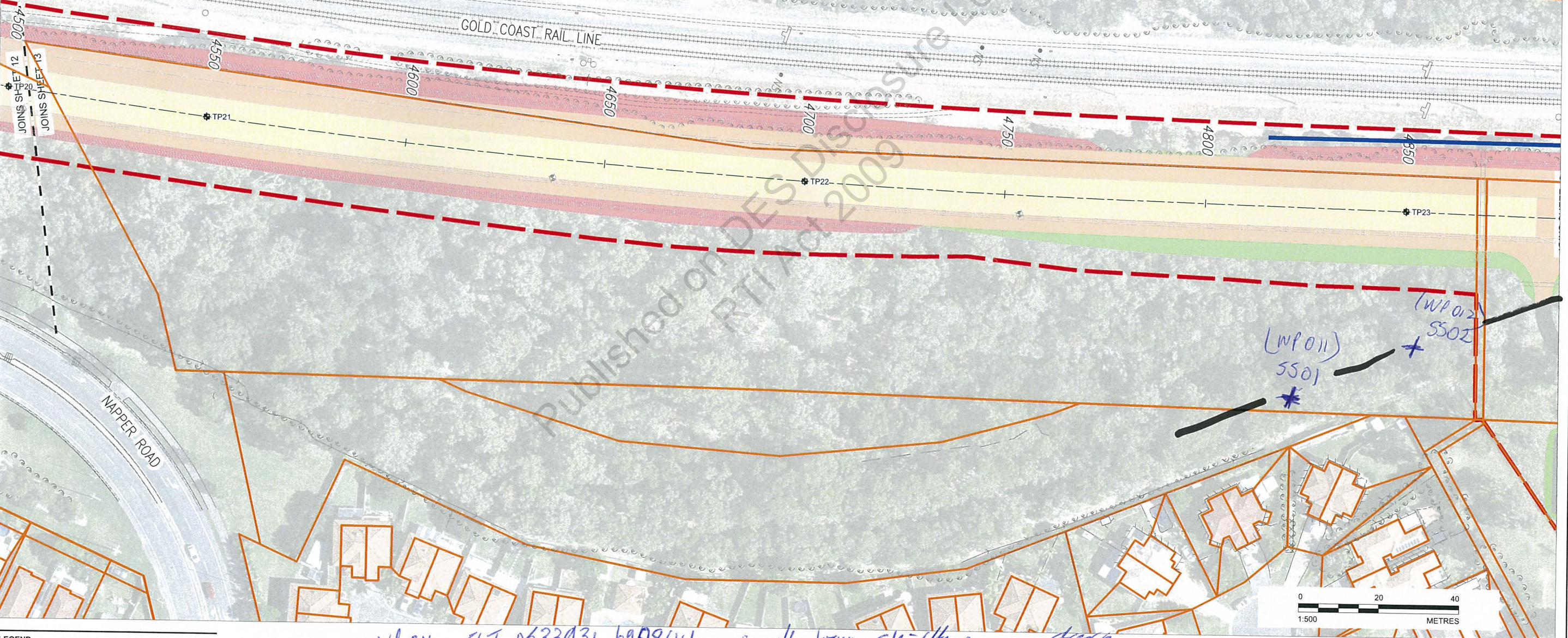
1	Analyte exceeds the ESL Criteria for Urban Residential and Public Open Space or Commercial and Industrial land use
1	Analyte exceeds reported Management Limits for hydrocarbons
1	Analyte exceeds HSL-A & HSL-B Criteria
1	Analyte exceeds the HSL-D criteria
1	Analyte exceeds the adopted Clean Fill Criteria
1	Adopted Clean Fill Criteria
1	Analyte exceeds the laboratory's limit of reporting (LOR)
-	Not analysed
NL	Not Limiting, for which the derived HSL exceeds the Csat, and cannot result in an unacceptable vapour risk for depth and soil type.
^	Generic Ecological Investigation Levels (EILs) for naphthalene, not dependent on soil type or soil physicochemical properties
*	Landfill criteria based on TPH fractions C ₆ -C ₉ , C ₁₀ -C ₁₄ , C ₁₅ -C ₂₈ and C ₂₉ -C ₃₆



GL2-FG-10-210-10-50013-A

GOLD COAST RAIL LINE

NAPPER ROAD



- LEGEND**
- ◆ BH BOREHOLE LOCATION
 - CPT CPT LOCATION
 - ◆ DCP DCP LOCATION
 - ◆ TP TEST PIT LOCATION
 - MASW SURVEY LOCATION

WP011 56J 0533931 6908641
WP012 1 0533921 6908667
Gravelly lot, slightly more of brown

CONSULTANT



YYYY-MM-DD	2016-04-19
DESIGNED	GdM
PREPARED	GPG
REVIEWED	GdM
APPROVED	GdM

PROJECT

GOLD COAST LIGHT RAIL STAGE 2

TITLE

PROPOSED SI LOCATIONS CH 4500 TO CH 4890

PROJECT NO.

CPB DRG No

REV.

GOLD COAST LIGHT RAIL STAGE 2

0

FIGURE

F013



GL2-FG-10-210-10-50014-A

GOLD COAST RAIL LINE

JOINS SHEET 3
JOINS SHEET 4

SS04 WPO14

5050

5000

5050

5100

5150

5200

5250

TP24

TP25

SS03
(WPO13)

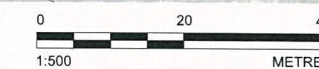
SS06
(WPO16)

SS07
(WPO17)

SS08
(WPO18)

SS05
(WPO15)

Published on DES Disposal
RTI Act 2009



- LEGEND
- ◆ BH BOREHOLE LOCATION
 - CPT CPT LOCATION
 - ◆ DCP DCP LOCATION
 - ◆ TP TEST PIT LOCATION
 - MASW SURVEY LOCATION

WP 013	56J	0533899	6908696
WP 014	"	0533872	6908683
WP 015	"	0533926	6908704
WP 016	"	0533886	6908719
WP 017	"	0533873	6908747
WP 018	"	0533863	6908784

Gravelly loam, light brown, ash slightly moist
Clayey sand, loose, light grey brown, slightly moist
" sand, med grey, dry
As per WPO13 but dry
As per 016 but grey black, pink
slm

CLIENT	CPB CONTRACTORS
CONSULTANT	Golder Associates
DESIGNED	GdM
PREPARED	GPG
REVIEWED	GdM
APPROVED	GdM
DATE	2016-04-19

GOLD COAST LIGHT RAIL STAGE 2

TITLE
PROPOSED SI LOCATIONS CH 4890 TO CH 5270

PROJECT NO. CPB DRG No. REV. FIGURE
GOLD COAST LIGHT RAIL STAGE 2 0 F014

CERTIFICATE OF ANALYSIS

Work Order : **EB1621816**
Client : **CPB CONTRACTORS PTY LTD**
Contact : MR [sch4p4(6) Person
Address : TRINITY BUILDING 82 EAGLE ST
 BRISBANE QLD, AUSTRALIA 40
Telephone : ----
Project : GCLR Stage 2
Order number : 4568479
C-O-C number : ----
Sampler : [sch4p4(6) Personal i
Site : ----
Quote number : ----
No. of samples received : 28
No. of samples analysed : 25

Page : 1 of 28
Laboratory : Environmental Division Brisbane
Contact :
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 02-Sep-2016 12:50
Date Analysis Commenced : 06-Sep-2016
Issue Date : 09-Sep-2016 16:31



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

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
- Surrogate Control Limits

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

Signatories

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

Signatories	Position	Accreditation Category
[sch4p4(6) Per	Laboratory Manager	Brisbane Inorganics, Stafford, QLD
	Senior Organic Chemist	Brisbane Organics, Stafford, QLD



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.

- EG035T (Total Mercury) Sample EM1621816-023 shows poor matrix spike recovery due to sample heterogeneity. Confirmed by visual inspection.
- EG035T (Total Mercury) Sample EM1621816-002 shows poor matrix spike recovery due to sample heterogeneity. Confirmed by visual inspection.
- EP068: Sample shows poor matrix spike recovery due to matrix interference.
- EP068: The LOR for dimethoate has been raised due to matrix interference.
- 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.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	1A - Surface	1B - 1m deep	2A - Surface	2B - 300mm	2C - 350mm
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-001	EB1621816-002	EB1621816-003	EB1621816-004	EB1621816-005
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		3.7	5.3	5.3	6.2	3.8
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		481	<5	143	133	112
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		9	6	6	3	9
Copper	7440-50-8	5	mg/kg		31	6	24	13	10
Lead	7439-92-1	5	mg/kg		44	<5	19	17	8
Nickel	7440-02-0	2	mg/kg		4	<2	<2	<2	<2
Zinc	7440-66-6	5	mg/kg		22	<5	96	38	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	1A - Surface	1B - 1m deep	2A - Surface	2B - 300mm	2C - 350mm
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-001	EB1621816-002	EB1621816-003	EB1621816-004	EB1621816-005
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
4,4'-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg		<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID				
Client sampling date / time				1A - Surface	1B - 1m deep	2A - Surface	2B - 300mm	2C - 350mm
Compound				EB1621816-001	EB1621816-002	EB1621816-003	EB1621816-004	EB1621816-005
CAS Number LOR Unit				Result	Result	Result	Result	Result
EP075(SIM)A: Phenolic Compounds - Continued								
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
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
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



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	1A - Surface	1B - 1m deep	2A - Surface	2B - 300mm	2C - 350mm
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-001	EB1621816-002	EB1621816-003	EB1621816-004	EB1621816-005
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ 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	120	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	120	<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
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		110	109	123	125	114
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		88.5	84.4	91.5	103	96.4
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		74.8	65.1	78.5	84.1	57.9
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		104	77.8	99.3	90.4	98.9
2-Chlorophenol-D4	93951-73-6	0.5	%		100	75.8	92.8	85.0	89.2
2,4,6-Tribromophenol	118-79-6	0.5	%		80.4	71.0	85.5	77.4	63.6
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		102	92.1	94.0	89.6	117
Anthracene-d10	1719-06-8	0.5	%		105	86.9	96.2	92.4	92.7
4-Terphenyl-d14	1718-51-0	0.5	%		109	92.7	101	94.3	112
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		81.9	80.1	82.0	85.6	90.0
Toluene-D8	2037-26-5	0.2	%		77.5	73.7	73.8	77.8	81.0



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	1A - Surface	1B - 1m deep	2A - Surface	2B - 300mm	2C - 350mm
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-001	EB1621816-002	EB1621816-003	EB1621816-004	EB1621816-005
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.2	%		93.8	88.0	88.7	85.7	85.5

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	3B - 300mm	3C - 400mm	3D - 500m	4A - Surface	5A - Surface
Client sampling date / time					[19-Aug-2016]	[19-Jul-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-007	EB1621816-008	EB1621816-009	EB1621816-010	EB1621816-011
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		7.4	7.9	13.2	11.7	14.9
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		147	6	<5	36	27
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		11	<2	3	3	2
Copper	7440-50-8	5	mg/kg		17	<5	<5	10	<5
Lead	7439-92-1	5	mg/kg		25	7	8	14	10
Nickel	7440-02-0	2	mg/kg		4	<2	<2	<2	<2
Zinc	7440-66-6	5	mg/kg		17	<5	<5	21	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
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	3B - 300mm	3C - 400mm	3D - 500m	4A - Surface	5A - Surface
Client sampling date / time					[19-Aug-2016]	[19-Jul-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-007	EB1621816-008	EB1621816-009	EB1621816-010	EB1621816-011
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
4,4'-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
	0-2								
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg		<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	3B - 300mm	3C - 400mm	3D - 500m	4A - Surface	5A - Surface
Client sampling date / time					[19-Aug-2016]	[19-Jul-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-007	EB1621816-008	EB1621816-009	EB1621816-010	EB1621816-011
					Result	Result	Result	Result	Result
EP075(SIM)A: Phenolic Compounds - Continued									
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg		<2	<2	<2	<2	<2
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
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	60	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	200	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	370	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	630	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	3B - 300mm	3C - 400mm	3D - 500m	4A - Surface	5A - Surface
Client sampling date / time					[19-Aug-2016]	[19-Jul-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-007	EB1621816-008	EB1621816-009	EB1621816-010	EB1621816-011
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ 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	60	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	340	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	310	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	710	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	60	<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
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		111	103	116	133	114
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		85.0	80.6	88.1	85.2	93.6
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		71.1	53.5	66.9	73.7	79.1
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		94.5	94.0	94.0	95.2	92.6
2-Chlorophenol-D4	93951-73-6	0.5	%		78.2	87.5	84.9	85.8	87.3
2,4,6-Tribromophenol	118-79-6	0.5	%		72.6	75.0	68.1	84.7	81.8
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		83.5	86.3	85.0	88.4	87.9
Anthracene-d10	1719-06-8	0.5	%		93.3	82.7	89.2	99.5	92.4
4-Terphenyl-d14	1718-51-0	0.5	%		93.3	95.8	91.7	100	95.3
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		82.2	84.7	87.5	79.3	79.2
Toluene-D8	2037-26-5	0.2	%		71.3	74.6	71.1	76.4	70.4



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	3B - 300mm	3C - 400mm	3D - 500m	4A - Surface	5A - Surface
Client sampling date / time					[19-Aug-2016]	[19-Jul-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-007	EB1621816-008	EB1621816-009	EB1621816-010	EB1621816-011
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.2	%		84.0	90.0	87.3	82.4	92.5

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	6A - 200m	7A - surface	7B - 500mm	7C - 750mm	8A - Surface
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-012	EB1621816-013	EB1621816-014	EB1621816-015	EB1621816-016
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		11.4	5.4	6.7	8.1	5.6
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	258	168	<5	376
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		6	10	10	4	4
Copper	7440-50-8	5	mg/kg		<5	32	19	<5	37
Lead	7439-92-1	5	mg/kg		17	34	22	8	33
Nickel	7440-02-0	2	mg/kg		<2	18	7	<2	5
Zinc	7440-66-6	5	mg/kg		5	118	38	<5	126
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	6A - 200m	7A - surface	7B - 500mm	7C - 750mm	8A - Surface
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-012	EB1621816-013	EB1621816-014	EB1621816-015	EB1621816-016
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
4,4'-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
	0-2								
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg		<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	6A - 200m	7A - surface	7B - 500mm	7C - 750mm	8A - Surface
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-012	EB1621816-013	EB1621816-014	EB1621816-015	EB1621816-016
					Result	Result	Result	Result	Result
EP075(SIM)A: Phenolic Compounds - Continued									
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg		<2	<2	<2	<2	<2
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
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	130	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	150	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	280	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	6A - 200m	7A - surface	7B - 500mm	7C - 750mm	8A - Surface
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-012	EB1621816-013	EB1621816-014	EB1621816-015	EB1621816-016
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ 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	210	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	110	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	320	<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
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		117	111	126	113	121
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		106	99.6	122	103	109
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		84.2	81.1	96.1	68.6	75.8
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		91.5	94.6	92.6	82.7	88.3
2-Chlorophenol-D4	93951-73-6	0.5	%		81.7	89.5	88.8	78.4	85.3
2,4,6-Tribromophenol	118-79-6	0.5	%		75.3	67.7	63.6	51.1	64.1
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		85.3	107	107	115	109
Anthracene-d10	1719-06-8	0.5	%		93.4	88.3	86.2	79.6	87.6
4-Terphenyl-d14	1718-51-0	0.5	%		93.6	115	121	120	123
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		80.0	82.7	86.5	81.1	85.4
Toluene-D8	2037-26-5	0.2	%		72.1	76.1	74.4	73.6	80.6



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	6A - 200m	7A - surface	7B - 500mm	7C - 750mm	8A - Surface
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-012	EB1621816-013	EB1621816-014	EB1621816-015	EB1621816-016
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.2	%		85.3	90.8	95.5	87.7	84.0

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	8B - 300mm	8C - 500mm	9A - Surface	9B - 300mm	9C - 500mm
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-017	EB1621816-018	EB1621816-019	EB1621816-020	EB1621816-021
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		4.8	9.5	6.4	4.7	5.2
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		175	<5	250	254	430
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		4	<2	5	<2	5
Copper	7440-50-8	5	mg/kg		32	<5	30	19	47
Lead	7439-92-1	5	mg/kg		37	<5	56	14	62
Nickel	7440-02-0	2	mg/kg		5	<2	5	<2	7
Zinc	7440-66-6	5	mg/kg		107	<5	112	146	77
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	8B - 300mm	8C - 500mm	9A - Surface	9B - 300mm	9C - 500mm
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-017	EB1621816-018	EB1621816-019	EB1621816-020	EB1621816-021
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
4,4'-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
	0-2								
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.20	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg		<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID				
Client sampling date / time				8B - 300mm	8C - 500mm	9A - Surface	9B - 300mm	9C - 500mm
Compound				EB1621816-017	EB1621816-018	EB1621816-019	EB1621816-020	EB1621816-021
CAS Number LOR Unit				Result	Result	Result	Result	Result
EP075(SIM)A: Phenolic Compounds - Continued								
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
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
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	230	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	170	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	400	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	8B - 300mm	8C - 500mm	9A - Surface	9B - 300mm	9C - 500mm
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-017	EB1621816-018	EB1621816-019	EB1621816-020	EB1621816-021
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ 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	340	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	110	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	450	<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
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		126	105	105	122	128
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		129	113	112	107	110
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		110	82.0	96.6	72.1	92.9
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		115	96.1	99.4	85.6	83.6
2-Chlorophenol-D4	93951-73-6	0.5	%		110	90.3	93.7	80.4	77.9
2,4,6-Tribromophenol	118-79-6	0.5	%		72.2	56.8	78.6	66.6	69.7
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		124	114	109	98.1	94.7
Anthracene-d10	1719-06-8	0.5	%		97.7	81.5	96.2	101	98.9
4-Terphenyl-d14	1718-51-0	0.5	%		133	122	116	108	107
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		81.8	80.6	85.1	79.5	78.6
Toluene-D8	2037-26-5	0.2	%		73.6	73.4	78.7	77.2	70.9



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	8B - 300mm	8C - 500mm	9A - Surface	9B - 300mm	9C - 500mm
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-017	EB1621816-018	EB1621816-019	EB1621816-020	EB1621816-021
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.2	%		88.4	80.6	88.7	88.1	84.2

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	9D - 750mm	10A - Surface	10B - 500mm	10C - 750mm	10 - Side Sample
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-022	EB1621816-023	EB1621816-024	EB1621816-025	EB1621816-026
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		14.5	7.3	4.9	12.4	1.4
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		223	18	5	7	100
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		3	6	3	4	6
Copper	7440-50-8	5	mg/kg		76	<5	<5	<5	22
Lead	7439-92-1	5	mg/kg		24	10	6	10	31
Nickel	7440-02-0	2	mg/kg		8	<2	<2	<2	5
Zinc	7440-66-6	5	mg/kg		122	<5	6	6	76
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID				
Client sampling date / time				9D - 750mm	10A - Surface	10B - 500mm	10C - 750mm	10 - Side Sample
Compound				EB1621816-022	EB1621816-023	EB1621816-024	EB1621816-025	EB1621816-026
CAS Number				Result	Result	Result	Result	Result
LOR								
Unit								
EP068A: Organochlorine Pesticides (OC) - Continued								
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
	0-2							
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID				
Client sampling date / time				9D - 750mm	10A - Surface	10B - 500mm	10C - 750mm	10 - Side Sample
Compound				EB1621816-022	EB1621816-023	EB1621816-024	EB1621816-025	EB1621816-026
CAS Number LOR Unit				Result	Result	Result	Result	Result
EP075(SIM)A: Phenolic Compounds - Continued								
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
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
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



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	9D - 750mm	10A - Surface	10B - 500mm	10C - 750mm	10 - Side Sample
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-022	EB1621816-023	EB1621816-024	EB1621816-025	EB1621816-026
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ 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
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		115	96.2	107	99.3	126
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		103	103	103	101	119
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		98.0	92.9	82.7	76.1	88.9
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		86.1	84.4	91.9	91.0	87.7
2-Chlorophenol-D4	93951-73-6	0.5	%		83.0	81.3	85.2	84.7	80.6
2,4,6-Tribromophenol	118-79-6	0.5	%		64.6	64.9	75.2	74.3	72.9
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		92.0	91.7	92.2	89.0	88.6
Anthracene-d10	1719-06-8	0.5	%		90.4	88.7	89.7	89.6	85.1
4-Terphenyl-d14	1718-51-0	0.5	%		95.9	95.9	93.0	92.7	89.6
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		81.3	101	84.7	84.3	88.5
Toluene-D8	2037-26-5	0.2	%		71.9	89.9	77.3	75.4	82.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	9D - 750mm	10A - Surface	10B - 500mm	10C - 750mm	10 - Side Sample
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-022	EB1621816-023	EB1621816-024	EB1621816-025	EB1621816-026
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.2	%		91.6	108	89.0	80.8	84.0

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Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	16	134
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	10	138
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	23	135
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	35	155
2-Chlorophenol-D4	93951-73-6	42	153
2,4,6-Tribromophenol	118-79-6	26	157
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	34	157
Anthracene-d10	1719-06-8	37	153
4-Terphenyl-d14	1718-51-0	42	172
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	53	134
Toluene-D8	2037-26-5	60	131
4-Bromofluorobenzene	460-00-4	59	127

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CERTIFICATE OF ANALYSIS

Work Order : **EB1622586**
Client : **CPB CONTRACTORS PTY LTD**
Contact : MR [sch4p4(6) Perso]
Address : TRINITY BUILDING 82 EAGLE ST
 BRISBANE QLD, AUSTRALIA 40

Telephone : ----
Project : GCLR Stage 2
Order number : 4568479
C-O-C number : ----
Sampler : [sch4p4(6) Personal information]
Site : ----
Quote number : ----
No. of samples received : 18
No. of samples analysed : 18

Page : 1 of 8
Laboratory : Environmental Division Brisbane
Contact :
Address : 2 Byth Street Stafford QLD Australia 4053

Telephone : +61-7-3243 7222
Date Samples Received : 15-Sep-2016 15:08
Date Analysis Commenced : 19-Sep-2016
Issue Date : 23-Sep-2016 09:34



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

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

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

Signatories

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

Signatories	Position	Accreditation Category
[sch4p4(6) Personal]	Senior Inorganic Chemist Asbestos Identifier	Brisbane Inorganics, Stafford, QLD 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.

- **This work order has been created to rebatch samples from previous ALS workorders EB1618850 and EB1621816**
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- 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: DI WATER LEACHATE
 (Matrix: WATER)

Client sample ID

				1A-Surface	2B-300mm	3B-300mm	7A-Surface	8A-Surface
Client sampling date / time				[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit	EB1622586-001	EB1622586-002	EB1622586-003	EB1622586-004	EB1622586-005
				Result	Result	Result	Result	Result
EG005W: Water Leachable Metals by ICPAES								
Arsenic	7440-38-2	0.01	mg/L	<0.01	0.15	0.14	1.14	0.08

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Analytical Results

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

Client sample ID

				9C-500mm	A60 SS01	A60 SS06	----	----
Client sampling date / time				[19-Aug-2016]	[25-Jul-2016]	[25-Jul-2016]	----	----
Compound	CAS Number	LOR	Unit	EB1622586-006	EB1622586-007	EB1622586-008	-----	-----
				Result	Result	Result	----	----
EG005W: Water Leachable Metals by ICPAES								
Arsenic	7440-38-2	0.01	mg/L	0.07	0.10	0.30	----	----

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Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				1A-Surface	2B-300mm	3B-300mm	7A-Surface	8A-Surface
Client sampling date / time				[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit	EB1622586-001	EB1622586-002	EB1622586-003	EB1622586-004	EB1622586-005
				Result	Result	Result	Result	Result
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:	----	-	--	----	----	----	----	----
EN60: Bottle Leaching Procedure								
Final pH	----	0.1	pH Unit	6.6	6.5	6.6	6.5	6.6

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	9C-500mm	A60 SS01	A60 SS06	2A-surface	2C-350mm
Client sampling date / time					[19-Aug-2016]	[25-Jul-2016]	[25-Jul-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit	EB1622586-006	EB1622586-007	EB1622586-008	EB1622586-009	EB1622586-010	
				Result	Result	Result	Result	Result	
EA200: AS 4964 - 2004 Identification of Asbestos in Soils									
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	----	No	No	
Asbestos Type	1332-21-4	-	--	----	----	----	-	-	
Sample weight (dry)	----	0.01	g	----	----	----	282	328	
APPROVED IDENTIFIER:	----	-	--	----	----	----	[sch4p4/ 6) Personal information]		
EN60: Bottle Leaching Procedure									
Final pH	----	0.1	pH Unit	6.7	6.3	6.2	----	----	

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	4A-surface	5A-surface	7B-500mm	8B-300mm	9A-surface
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1622586-011	EB1622586-012	EB1622586-013	EB1622586-014	EB1622586-015
					Result	Result	Result	Result	Result
EA200: AS 4964 - 2004 Identification of Asbestos in Soils									
Asbestos Detected	1332-21-4	0.1	g/kg		No	No	No	No	No
Asbestos Type	1332-21-4	-	--		-	-	-	-	-
Sample weight (dry)	----	0.01	g		150	176	168	147	132
APPROVED IDENTIFIER:	----	-	--		sch4p4(6) Personal information				
EN60: Bottle Leaching Procedure									
Final pH	----	0.1	pH Unit		----	----	----	----	----

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	10-side sample	A60-SS02	A60-SS03	----	----
Client sampling date / time					[19-Aug-2016]	[25-Jul-2016]	[25-Jul-2016]	----	----
Compound	CAS Number	LOR	Unit		EB1622586-016	EB1622586-017	EB1622586-018	-----	-----
					Result	Result	Result	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils									
Asbestos Detected	1332-21-4	0.1	g/kg		No	No	No	----	----
Asbestos Type	1332-21-4	-	--		-	-	-	----	----
Sample weight (dry)	----	0.01	g		103	255	177	----	----
APPROVED IDENTIFIER:	----	-	--		sch4p4(6) Personal information			----	----
EN60: Bottle Leaching Procedure									
Final pH	----	0.1	pH Unit		----	----	----	----	----

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	2A-surface - [19-Aug-2016]
EA200: Description	2C-350mm - [19-Aug-2016]
EA200: Description	4A-surface - [19-Aug-2016]
EA200: Description	5A-surface - [19-Aug-2016]
EA200: Description	7B-500mm - [19-Aug-2016]
EA200: Description	8B-300mm - [19-Aug-2016]
EA200: Description	9A-surface - [19-Aug-2016]
EA200: Description	10-side sample - [19-Aug-2016]
EA200: Description	A60-SS02 - [25-Jul-2016]
EA200: Description	A60-SS03 - [25-Jul-2016]

Date : 18/10/2016 2:58:14 PM

From: [sch4p4(6) Person]

To : "BROWN Josh (EHP)"

Subject : RE: Notification of low level contaminated land - Gold Coast Light Rail Stage 2

Attachment : Summary Briefing - GCLR Ballast.pdf;image002.jpg;image003.jpg;image005.png;image006.png;

Afternoon Josh,

I have attached the summary advice which has contained within, the summary advice including the contamination spreadsheets and ALS data sets. This should be sufficient for the Department to assess whether it should be listed or not.

Please note that the Remediation Plan I sent was a preliminary/draft to keep the Department updated as information comes to hand. I will formally transmit the final SQP reports and verification once we are ready to lodge the EMR paperwork. As built red line drawings of the final resting place within the alignment will be submitted as the final design package also.

Please let me know if I can be of any more assistance.

Cheers,

[sch4p4(6) Personal in

Environmental Manager



32 Industrial Avenue, Molendinar, QLD, Australia

T +61738519030 M [sch4p4(6) Per]

E [sch4p4(6)]@cpbcon.com.au

cpbcon.com.au

A MEMBER OF THE CIMIC GROUP



From: BROWN Josh (EHP) [mailto:Josh.BrownEHP@ehp.qld.gov.au]

Sent: Tuesday, 18 October 2016 1:50 PM

To: [sch4p4(6) Per]

Subject: RE: Notification of low level contaminated land - Gold Coast Light Rail Stage 2

Hi [sch4p

Thankyou for providing notification. Could you please supply the referenced summary tables and laboratory results (Table T1, Table T2, ALS Report EB1621816, ALS report EB1622586).

Yours sincerely,



Josh Brown

Environmental Officer

Waste and Contaminated Land | Industry & Development Assessment

Department of Environment and Heritage Protection

P 07 3330 5576

400 George Street, Brisbane QLD 4000

GPO Box 2454, Brisbane QLD 4001

From: [sch4p4(6) Personal information] [mailto:[sch4p4(6) Per]@cpbcon.com.au]

Sent: Monday, 17 October 2016 11:33 AM

To: Pollution Hotline <PollutionHotline@ehp.qld.gov.au>

Cc: Brad May <bmay@epicenvironmental.com.au>

Subject: Notification of low level contaminated land - Gold Coast Light Rail Stage 2

Morning,

After talking with Jeff on the 1300 number, I am writing to formally notify the Department of the low level contaminated ballast on the historic rail corridor at Parkwood and Helensvale (Lot details contained within the Remediation Plan). The Project's SQP, Brad May from EPIC Environmental, has drafted the Remediation Plan that is endorsed by CPB Contractors and under review currently with the Department of Transport and Mainroads who will be the Registered owner/occupier at the completion of the Light Rail Project. Internal Project notification and preliminary workshops have been facilitated by CPB Contractors with our Client and SQP.

The attached DRAFT Remediation Plan has been prepared for the property located in the alignment of the Gold Coast Light Rail Stage 2. The focus of the RP is limited to the 2 areas that have identified as containing historic rail ballast (The Site).

The location of the rail ballast is shown on the attached site plans for the 2 areas located on Lot 202 SP260950 and Lot 3 RP887429.

Please note that both attached documents are currently in DRAFT review status waiting for further site investigation and Client owner details. Notification paperwork will be formally transmitted, with details in Section 9 completed when CPB Contractors client details are made available. Also, the Remediation Plan will be finalised by the Project's SQP and transmitted with the required validation/verification once works have been completed.

Please contact myself directly with any questions/clarification as required.

Kind regards

sch4p4(6) Person

Environmental Manager


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Technical Memo

To: CPB Contractors	From: Brad May	Attention: sch4p4(6) Personal i
Email: sch4p4(6) Perso@cpbcon.com.au		
Project No: B160216.01	Date: 29 September 2016	
Subject: GCLR2 - Historical Ballast.		

sch4p4(6)

Epic Environmental has been engaged by CPB to assist with contaminated land matters as part of the Gold Coast Light Rail Stage 2 Project. Outlined below is a summary of the analytical results from the sampling undertaken by CPB from historical rail ballast encountered within the GCLR2 alignment to the north and south of Coombabah Creek. The purpose of this Technical Memo is to summarise the laboratory results and develop and approach to develop a management approach for the material.

The historical ballast was encountered following the initial vegetation clearing of the area. It is believed that the ballast is a remnant of the original Beenleigh to Southport line that was decommissioned in 1964. The volume and location of historical ballast located at the two separate areas has been surveyed by CPB as indicated below:

- Lot 202/SP260950 (Chainage 13973 to 14160) - Volume: 1,061.16 m³
- Lot 3 RP 887429 (Chainage 15020 – 15120) - Volume: 445.17 m³

CPB field staff collected samples from the Ballast on 2 September 2016 across the ballast profile and submitted 33 samples for laboratory analysis. The laboratory analysis included:

- Heavy Metal;
- Pesticides,
- Polychlorinated byphenols;
- Polynuclear Aromatic hydrocarbons
- Total Recoverable Hydrocarbons;
- Phenols; and
- Benzene, Toluene, Ethylbenzene, Xylene, Naphthalene.

Epic reviewed the laboratory information and requested that further analysis to be conducted to include eight samples for asbestos and eight samples for a neutral leach (deionised water) specifically for arsenic. The purpose of the neutral leach assessment was to determine if the arsenic concentrations identified in the ballast was leachable under simulated natural rainfall conditions.

Results Summary

The results from the initial laboratory analysis returned elevated concentrations for arsenic and total recoverable hydrocarbons (TRH). The elevated TRH results were however only marginally above the Ecological Screening Levels (ESL) for urban residential and open space with only one sample returning a result above Health Screen Levels (HSL) - A residential landuse.

The arsenic concentrations however exceeded the HSL-A residential criteria in 17 of the 33 samples analysed with 16 samples also exceeding the ESL for Commercial and Industrial landuse. The results have been summarised on the attached **Table T1** and **Table T2**.

The subsequent neutral leaching potential analysis for requested arsenic returned results that indicated leachable concentrations ranging from <0.01ug/L to 1.14ug/L with seven of the eight samples submitted returning arsenic above the level of reporting.

Management Approach

Current best practise approach for management within existing Lot/Plan would see management within the embankment/formation of the new works as the immediate area will require imported fill for construction. The elevated arsenic concentrations identified above the sensitive landuse criteria (HSL-A and ESLs) and the demonstrated leaching potential of arsenic in the ballast will require management measures to be adopted to allow reuse within the embankment. CPB have identified predominately heavy clays as the dominate soil type in the vicinity of the ballast that may have limited arsenic migration to date.

The attached plans indicate a typical cross section and long section for the embankment. As indicated the intention is to encapsulate the historical ballast within the embankment that will provide sufficient cover to limit surface water interaction therefore minimising the potential for arsenic migration and exposure to future users for the site. In addition to a minimum 1.5m of cover layer in all directions, it is recommended that the historical ballast is also covered with an impermeable marker layer (builders plastic/HDPE) to further limit surface water infiltration and to provide an indication of the material location.

The historical ballast is currently located within the same lot and plan and should not be relocated across the lot boundaries. As contaminants have been identified at the site above the sensitive landuse criteria, a formal notification to DEHP will be required by the site owner and placement of the lot on the EMR.

At a minimum, the owner of the site should also identify the encapsulation area within the asset management system to allow for effective future management in the event that the material will be

uncovered through future works such as installation of services. CPB will undertake full survey detail of the encapsulation extents.

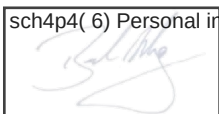
Further Actions

The following actions are recommended to allow the material to be reused on site:

- The owner of the site is to notify DEHP under Section 320 of the EP Act;
- Allowance in the design to accommodate the material with a minimum of 1.5m coverage and suitable barrier layer installed once placed;
- Over excavation of the current ballast areas by 200mm to ensure all ballast had been relocated;
- The current location of the ballast is inspected once the ballast has been relocated to ensure all material has been removed and validation samples collected; and
- Provide a brief close out report that describes the location of the material and summarises the works undertaken.

Please do not hesitate to contact me if you require further clarification.

Regards

sch4p4(6) Personal in


Brad May

Principal Environmental Engineer

Attachments:

Table T1, Table T2, ALS Report EB1621816, ALS report EB1622586, Concept Drawings, Location Plans

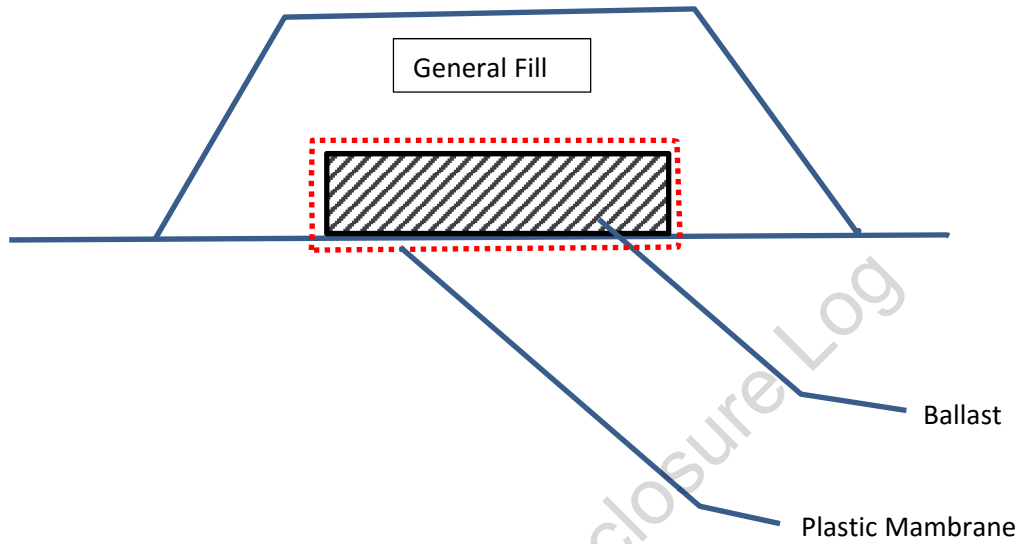


Table T1: Soil Analytical Results - EILs and HILs

Sample Date	Sample Duplicate	Sample Number	Sample Depth (m)	Material Type	Asbestos	PAH				Phenols				PCB	Cyanide (total)	Organics (mg/kg)					Pesticides					Inorganics (mg/kg)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
					Asbestos (Presence / Absence)	Total	Benzo (a) pyrene	Benzo (a) pyrene TEQ	Phenol	Pentachloro phenol	Cresols	DDT	Aldrin & Dieldrin			Chlordane	Endosulfan	Endrin	Heptachlor	HCB	Methoxychlor	Chlorpyrifos	Metals																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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NOTES:
1 Analyte exceeds the generic EIL Guideline Criteria for Urban Residential and Public Open Space or Commercial and Industrial Land Use
1 Analyte exceeds the HIL-A Guideline Criteria
1 Analyte exceeds the HIL-B Guideline Criteria
1 Analyte exceeds the HIL-D Guideline Criteria
1 Adopted Clean Fill Criteria for unrestricted use of soils
† Inorganic Mercury
* Criteria for Cr (VI)
^ Criteria for Cr (III)
Ecological Screening Levels (ESLs) for benzo(a)pyrene for coarse | fine soils
* Generic Added Contaminant Level

Table T2: Soil Analytical Results - ESLs and HSLs

Sample Date	Sample Duplicate	Sample Number	Sample Depth (m)	Material Type	Organics (mg/kg)						BTEXN				
					C ₆ -C ₁₀ minus BTEX (F1)	C ₆ -C ₁₀	>C ₁₀ -C ₁₆ minus naphthalene (F2)	>C ₁₀ -C ₁₆	>C ₁₆ -C ₃₄	>C ₃₄	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
Soil Saturation Concentration (Csat) - Sand Silt Clay					950 910 850	950 910 850	560 570 560	560 570 560	-	-	360 440 430	560 640 630	64 69 68	300 330 330	9 10 10
ESL (Urban Residential & Public Open Space) - Coarse Fine					180 180	-	-	120 120	300 1,300	2,800 5,600	50 65	85 105	70 125	105 45	170^
ESL (Commercial/Industrial) - Coarse Fine					215 215	-	-	170 170	1,700 2,500	3,300 6,600	75 95	135 135	165 185	180 95	370^
Management Limit (Residential, parkland & public open space) - Coarse Soil Fine Soil					-	700 800	-	1,000 1,000	2,500 3,500	10,000 10,000	-	-	-	-	-
Management Limit (Commercial & Industrial) - Coarse Soil Fine Soil					-	700 800	-	1,000 1,000	3,500 5,000	10,000 10,000	-	-	-	-	-
HSL-A & HSL-B (Low - High Density Residential) Vapour Intrusion - 0m to <1m - Sand Silt Clay					45 40 50	-	110 230 280	-	-	-	0.5 0.6 0.7	160 390 480	55 NL NL	40 95 110	3 4 5
HSL-A & HSL-B (Low - High Density Residential) Vapour Intrusion - 1m to <2m - Sand Silt Clay					70 65 90	-	240 NL NL	-	-	-	0.5 0.7 1	220 NL NL	NL NL NL	60 210 310	NL NL NL
HSL-A & HSL-B (Low - High Density Residential) Vapour Intrusion - 2m to <4m - Sand Silt Clay					110 100 150	-	440 NL NL	-	-	-	0.5 1 2	310 NL NL	NL NL NL	95 NL NL	NL NL NL
HSL-A & HSL-B (Low - High Density Residential) Vapour Intrusion - 4m + - Sand Silt Clay					200 190 290	-	NL NL NL	-	-	-	0.5 2 3	540 NL NL	NL NL NL	170 NL NL	NL NL NL
HSL-C (Recreational/Open Space) Vapour Intrusion - 0m to <1m - Sand Silt Clay					NL NL NL	-	NL NL NL	-	-	-	NL NL NL	NL NL NL	NL NL NL	NL NL NL	NL NL NL
HSL-C (Recreational/Open Space) Vapour Intrusion - 1m to <2m - Sand Silt Clay					NL NL NL	-	NL NL NL	-	-	-	NL NL NL	NL NL NL	NL NL NL	NL NL NL	NL NL NL
HSL-C (Recreational/Open Space) Vapour Intrusion - 2m to <4m - Sand Silt Clay					NL NL NL	-	NL NL NL	-	-	-	NL NL NL	NL NL NL	NL NL NL	NL NL NL	NL NL NL
HSL-C (Recreational/Open Space) Vapour Intrusion - 4m + - Sand Silt Clay					NL NL NL	-	NL NL NL	-	-	-	NL NL NL	NL NL NL	NL NL NL	NL NL NL	NL NL NL
HSL-D (Commercial/Industrial) Vapour Intrusion - 0m to <1m - Sand Silt Clay					260 250 310	-	NL NL NL	-	-	-	3 4 4	NL NL NL	NL NL NL	230 NL NL	NL NL NL
HSL-D (Commercial/Industrial) Vapour Intrusion - 1m to <2m - Sand Silt Clay					370 360 480	-	NL NL NL	-	-	-	3 4 6	NL NL NL	NL NL NL	NL NL NL	NL NL NL
HSL-D (Commercial/Industrial) Vapour Intrusion - 2m to <4m - Sand Silt Clay					630 590 NL	-	NL NL NL	-	-	-	3 6 9	NL NL NL	NL NL NL	NL NL NL	NL NL NL
HSL-D (Commercial/Industrial) Vapour Intrusion - 4m + - Sand Silt Clay					NL NL NL	-	NL NL NL	-	-	-	3 10 20	NL NL NL	NL NL NL	NL NL NL	NL NL NL
Adopted Clean Fill Criteria					40	700	110	120	300	2,800	0.5	85	55	40	3
Landfill Criteria - Unlined (mg/kg)					-	500*	-	5,000*	10,000*	10,000*	10	500	300	250	-
Landfill Criteria - Maximum (mg/kg)					-	1,000*	-	10,000*	50,000*	50,000*	20	1,000	600	500	-
Laboratory Level of Reporting (mg/kg)					10	10	50	50	100	100	0.2	0.5	1	0.3	1
25-Jul-16	-	A60 SS01	0.0	Soil	<10	<10	60	60	260	110	<0.2	<0.5	<0.5	<1	<1
25-Jul-16	-	A60 SS02	0.0	Soil	<10	<10	<50	<50	130	<100	<0.2	<0.5	<0.5	<1	<1
25-Jul-16	-	A60 SS03	0.0	Soil	<10	<10	210	210	460	160	<0.2	<0.5	<0.5	<1	<1
25-Jul-16	-	A60 SS04	0.0	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
25-Jul-16	-	A60 SS05	0.0	Soil	<10	<10	<50	<50	120	<100	<0.2	<0.5	<0.5	<1	<1
25-Jul-16	-	A60 SS06	0.0	Soil	<10	<10	<50	<50	110	<100	<0.2	<0.5	<0.5	<1	<1
25-Jul-16	-	A60 SS07	0.0	Soil	<10	<10	<50	<50	200	100	<0.2	<0.5	<0.5	<1	<1
25-Jul-16	-	A60 SS08	0.0	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	1A - Surface	0.0	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	1B - 1m deep	1.0	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	2A - Surface	0.0	Soil	<10	<10	<50	<50	120	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	2B - 300mm	0.3	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	2C - 350mm	0.35	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	3B - 300mm	0.3	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	3C - 400mm	0.4	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	3D - 500m	0.5	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	4A - Surface	0.0	Soil	<10	<10	60	60	340	310	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	5A - Surface	0.0	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	6A - 200m	0.2	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	7A - surface	0.0	Soil	<10	<10	<50	<50	210	110	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	7B - 500mm	0.5	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	7C - 750mm	0.75	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	8A - Surface	0.0	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	8B - 300mm	0.3	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	8C - 500mm	0.5	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	9A - Surface	0.0	Soil	<10	<10	<50	<50	340	110	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	9B - 300mm	0.3	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	9C - 500mm	0.5	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	9D - 750mm	0.75	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	10A - Surface	0.0	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	10B - 500mm	0.5	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	10C - 750mm	0.75	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1
19-Aug-16	-	10 - Side Sample	0.0	Soil	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<1	<1

NOTES:

1	Analyte exceeds the ESL Criteria for Urban Residential and Public Open Space or Commercial and Industrial land use
1	Analyte exceeds reported Management Limits for hydrocarbons
1	Analyte exceeds HSL-A & HSL-B Criteria
1	Analyte exceeds the HSL-D criteria
1	Analyte exceeds the adopted Clean Fill Criteria
1	Adopted Clean Fill Criteria
1	Analyte exceeds the laboratory's limit of reporting (LOR)
-	Not analysed
NL	Not Limiting, for which the derived HSL exceeds the Csat, and cannot result in an unacceptable vapour risk for depth and soil type.
^	Generic Ecological Investigation Levels (EILs) for naphthalene, not dependent on soil type or soil physicochemical properties
*	Landfill criteria based on TPH fractions C ₆ -C ₉ , C ₁₀ -C ₁₄ , C ₁₅ -C ₂₈ and C ₂₉ -C ₃₆



GL2-FG-10-210-10-50013-A

GOLD COAST RAIL LINE

NAPPER ROAD

JOINS SHEET 12
JOINS SHEET 13

4550

4600

4650

4700

4750

4800

4850

TP21

TP22

TP23

(WP011) 5501

(WP012) 5502



- LEGEND**
- ◆ BH BOREHOLE LOCATION
 - CPT CPT LOCATION
 - ★ DCP DCP LOCATION
 - ✱ TP TEST PIT LOCATION
 - MASW SURVEY LOCATION

WP011 56J 0533931 6908641
WP012 4 0533921 6908667

Gravelly loam, slightly more dark brown

CONSULTANT



YYYY-MM-DD	2016-04-19
DESIGNED	GdM
PREPARED	GPG
REVIEWED	GdM
APPROVED	GdM

PROJECT

GOLD COAST LIGHT RAIL STAGE 2

TITLE

PROPOSED SI LOCATIONS CH 4500 TO CH 4890

PROJECT NO.

CPB DRG No

REV.

GOLD COAST LIGHT RAIL STAGE 2

0

FIGURE

F013

Path: \\pdker\gdp\app\Brisbane\Geomatics\CPB\GOLD COAST LIGHT RAIL STAGE 2\202_PRODUCTION\DWG\1 File Name: 1526409-001-F013.dwg

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ISO A1



GL2-FG-10-210-10-50014-A

GOLD COAST RAIL LINE

JOINS SHEET 3
JOINS SHEET 4

SS04 WPO14

5090

5000

5050

5100

5150

5200

5250

TP24

TP25

SS03
(WPO13)

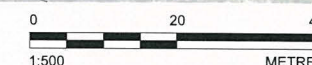
SS06
(WPO16)

SS07
(WPO17)

SS08
(WPO18)

SS05
(WPO15)

Published on DES Disposal
RTI Act 2009



- LEGEND
- ◆ BH BOREHOLE LOCATION
 - CPT CPT LOCATION
 - ★ DCP DCP LOCATION
 - ✱ TP TEST PIT LOCATION
 - MASW SURVEY LOCATION

WP 013	56J	0533899	6908696
WP 014	"	0533872	6908683
WP 015	"	0533926	6908704
WP 016	"	0533886	6908719
WP 017	"	0533873	6908747
WP 018	"	0533863	6908784

Gravelly loam, light brown, ash slightly moist
Clayey sand, loose, light grey brown, slightly moist
" sand, med grey, dry
As per WPO13 but dry
As per 016 but grey black, pink
slm

CLIENT	CPB CONTRACTORS
CONSULTANT	Golder Associates
DESIGNED	GdM
PREPARED	GPg
REVIEWED	GdM
APPROVED	GdM
DATE	2016-04-19

GOLD COAST LIGHT RAIL STAGE 2

PROPOSED SI LOCATIONS CH 4890 TO CH 5270

PROJECT NO. CPB DRG No. REV. 0
GOLD COAST LIGHT RAIL STAGE 2

FIGURE F014

CERTIFICATE OF ANALYSIS

Work Order : **EB1621816**
Client : **CPB CONTRACTORS PTY LTD**
Contact : sch4p4(6) Personal info
Address : TRINITY BUILDING 82 EAGLE ST
 BRISBANE QLD, AUSTRALIA 40

Telephone : ----
Project : GCLR Stage 2
Order number : 4568479
C-O-C number : ----
Sampler : sch4p4(6) Personal info
Site : ----
Quote number : ----
No. of samples received : 28
No. of samples analysed : 25

Page : 1 of 28
Laboratory : Environmental Division Brisbane
Contact :
Address : 2 Byth Street Stafford QLD Australia 4053

Telephone : +61-7-3243 7222
Date Samples Received : 02-Sep-2016 12:50
Date Analysis Commenced : 06-Sep-2016
Issue Date : 09-Sep-2016 16:31



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

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
- Surrogate Control Limits

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

Signatories

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

Signatories

sch4p4(6) Per

Position

Laboratory Manager
 Senior Organic Chemist

Accreditation Category

Brisbane Inorganics, Stafford, QLD
 Brisbane Organics, Stafford, QLD



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.

- EG035T (Total Mercury) Sample EM1621816-023 shows poor matrix spike recovery due to sample heterogeneity. Confirmed by visual inspection.
- EG035T (Total Mercury) Sample EM1621816-002 shows poor matrix spike recovery due to sample heterogeneity. Confirmed by visual inspection.
- EP068: Sample shows poor matrix spike recovery due to matrix interference.
- EP068: The LOR for dimethoate has been raised due to matrix interference.
- 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.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	1A - Surface	1B - 1m deep	2A - Surface	2B - 300mm	2C - 350mm
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-001	EB1621816-002	EB1621816-003	EB1621816-004	EB1621816-005
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		3.7	5.3	5.3	6.2	3.8
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		481	<5	143	133	112
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		9	6	6	3	9
Copper	7440-50-8	5	mg/kg		31	6	24	13	10
Lead	7439-92-1	5	mg/kg		44	<5	19	17	8
Nickel	7440-02-0	2	mg/kg		4	<2	<2	<2	<2
Zinc	7440-66-6	5	mg/kg		22	<5	96	38	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	1A - Surface	1B - 1m deep	2A - Surface	2B - 300mm	2C - 350mm
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-001	EB1621816-002	EB1621816-003	EB1621816-004	EB1621816-005
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
4,4'-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg		<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID				
Client sampling date / time				1A - Surface	1B - 1m deep	2A - Surface	2B - 300mm	2C - 350mm
Compound				EB1621816-001	EB1621816-002	EB1621816-003	EB1621816-004	EB1621816-005
CAS Number LOR Unit				Result	Result	Result	Result	Result
EP075(SIM)A: Phenolic Compounds - Continued								
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
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
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



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	1A - Surface	1B - 1m deep	2A - Surface	2B - 300mm	2C - 350mm
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-001	EB1621816-002	EB1621816-003	EB1621816-004	EB1621816-005
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ 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	120	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	120	<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
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		110	109	123	125	114
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		88.5	84.4	91.5	103	96.4
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		74.8	65.1	78.5	84.1	57.9
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		104	77.8	99.3	90.4	98.9
2-Chlorophenol-D4	93951-73-6	0.5	%		100	75.8	92.8	85.0	89.2
2,4,6-Tribromophenol	118-79-6	0.5	%		80.4	71.0	85.5	77.4	63.6
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		102	92.1	94.0	89.6	117
Anthracene-d10	1719-06-8	0.5	%		105	86.9	96.2	92.4	92.7
4-Terphenyl-d14	1718-51-0	0.5	%		109	92.7	101	94.3	112
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		81.9	80.1	82.0	85.6	90.0
Toluene-D8	2037-26-5	0.2	%		77.5	73.7	73.8	77.8	81.0



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	1A - Surface	1B - 1m deep	2A - Surface	2B - 300mm	2C - 350mm
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-001	EB1621816-002	EB1621816-003	EB1621816-004	EB1621816-005
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.2	%		93.8	88.0	88.7	85.7	85.5

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	3B - 300mm	3C - 400mm	3D - 500m	4A - Surface	5A - Surface
Client sampling date / time					[19-Aug-2016]	[19-Jul-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-007	EB1621816-008	EB1621816-009	EB1621816-010	EB1621816-011
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		7.4	7.9	13.2	11.7	14.9
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		147	6	<5	36	27
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		11	<2	3	3	2
Copper	7440-50-8	5	mg/kg		17	<5	<5	10	<5
Lead	7439-92-1	5	mg/kg		25	7	8	14	10
Nickel	7440-02-0	2	mg/kg		4	<2	<2	<2	<2
Zinc	7440-66-6	5	mg/kg		17	<5	<5	21	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
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	3B - 300mm	3C - 400mm	3D - 500m	4A - Surface	5A - Surface
Client sampling date / time					[19-Aug-2016]	[19-Jul-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-007	EB1621816-008	EB1621816-009	EB1621816-010	EB1621816-011
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
4,4'-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
	0-2								
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg		<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	3B - 300mm	3C - 400mm	3D - 500m	4A - Surface	5A - Surface
Client sampling date / time					[19-Aug-2016]	[19-Jul-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-007	EB1621816-008	EB1621816-009	EB1621816-010	EB1621816-011
					Result	Result	Result	Result	Result
EP075(SIM)A: Phenolic Compounds - Continued									
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg		<2	<2	<2	<2	<2
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
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	60	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	200	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	370	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	630	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	3B - 300mm	3C - 400mm	3D - 500m	4A - Surface	5A - Surface
Client sampling date / time					[19-Aug-2016]	[19-Jul-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-007	EB1621816-008	EB1621816-009	EB1621816-010	EB1621816-011
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
[^] 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	60	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	340	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	310	<100
[^] >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	710	<50
[^] >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	60	<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
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		111	103	116	133	114
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		85.0	80.6	88.1	85.2	93.6
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		71.1	53.5	66.9	73.7	79.1
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		94.5	94.0	94.0	95.2	92.6
2-Chlorophenol-D4	93951-73-6	0.5	%		78.2	87.5	84.9	85.8	87.3
2,4,6-Tribromophenol	118-79-6	0.5	%		72.6	75.0	68.1	84.7	81.8
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		83.5	86.3	85.0	88.4	87.9
Anthracene-d10	1719-06-8	0.5	%		93.3	82.7	89.2	99.5	92.4
4-Terphenyl-d14	1718-51-0	0.5	%		93.3	95.8	91.7	100	95.3
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		82.2	84.7	87.5	79.3	79.2
Toluene-D8	2037-26-5	0.2	%		71.3	74.6	71.1	76.4	70.4



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	3B - 300mm	3C - 400mm	3D - 500m	4A - Surface	5A - Surface
				Client sampling date / time	[19-Aug-2016]	[19-Jul-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-007	EB1621816-008	EB1621816-009	EB1621816-010	EB1621816-011
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.2	%		84.0	90.0	87.3	82.4	92.5

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	6A - 200m	7A - surface	7B - 500mm	7C - 750mm	8A - Surface
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-012	EB1621816-013	EB1621816-014	EB1621816-015	EB1621816-016
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		11.4	5.4	6.7	8.1	5.6
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	258	168	<5	376
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		6	10	10	4	4
Copper	7440-50-8	5	mg/kg		<5	32	19	<5	37
Lead	7439-92-1	5	mg/kg		17	34	22	8	33
Nickel	7440-02-0	2	mg/kg		<2	18	7	<2	5
Zinc	7440-66-6	5	mg/kg		5	118	38	<5	126
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	6A - 200m	7A - surface	7B - 500mm	7C - 750mm	8A - Surface
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-012	EB1621816-013	EB1621816-014	EB1621816-015	EB1621816-016
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
4,4'-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg		<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	6A - 200m	7A - surface	7B - 500mm	7C - 750mm	8A - Surface
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-012	EB1621816-013	EB1621816-014	EB1621816-015	EB1621816-016
					Result	Result	Result	Result	Result
EP075(SIM)A: Phenolic Compounds - Continued									
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg		<2	<2	<2	<2	<2
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
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	130	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	150	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	280	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	6A - 200m	7A - surface	7B - 500mm	7C - 750mm	8A - Surface
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-012	EB1621816-013	EB1621816-014	EB1621816-015	EB1621816-016
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ 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	210	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	110	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	320	<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
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		117	111	126	113	121
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		106	99.6	122	103	109
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		84.2	81.1	96.1	68.6	75.8
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		91.5	94.6	92.6	82.7	88.3
2-Chlorophenol-D4	93951-73-6	0.5	%		81.7	89.5	88.8	78.4	85.3
2,4,6-Tribromophenol	118-79-6	0.5	%		75.3	67.7	63.6	51.1	64.1
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		85.3	107	107	115	109
Anthracene-d10	1719-06-8	0.5	%		93.4	88.3	86.2	79.6	87.6
4-Terphenyl-d14	1718-51-0	0.5	%		93.6	115	121	120	123
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		80.0	82.7	86.5	81.1	85.4
Toluene-D8	2037-26-5	0.2	%		72.1	76.1	74.4	73.6	80.6



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	6A - 200m	7A - surface	7B - 500mm	7C - 750mm	8A - Surface
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-012	EB1621816-013	EB1621816-014	EB1621816-015	EB1621816-016
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.2	%		85.3	90.8	95.5	87.7	84.0

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	8B - 300mm	8C - 500mm	9A - Surface	9B - 300mm	9C - 500mm
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-017	EB1621816-018	EB1621816-019	EB1621816-020	EB1621816-021
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		4.8	9.5	6.4	4.7	5.2
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		175	<5	250	254	430
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		4	<2	5	<2	5
Copper	7440-50-8	5	mg/kg		32	<5	30	19	47
Lead	7439-92-1	5	mg/kg		37	<5	56	14	62
Nickel	7440-02-0	2	mg/kg		5	<2	5	<2	7
Zinc	7440-66-6	5	mg/kg		107	<5	112	146	77
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	8B - 300mm	8C - 500mm	9A - Surface	9B - 300mm	9C - 500mm
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-017	EB1621816-018	EB1621816-019	EB1621816-020	EB1621816-021
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
4,4'-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
	0-2								
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.20	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg		<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID				
Client sampling date / time				8B - 300mm	8C - 500mm	9A - Surface	9B - 300mm	9C - 500mm
Compound				EB1621816-017	EB1621816-018	EB1621816-019	EB1621816-020	EB1621816-021
CAS Number LOR Unit				Result	Result	Result	Result	Result
EP075(SIM)A: Phenolic Compounds - Continued								
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
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
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	230	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	170	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	400	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	8B - 300mm	8C - 500mm	9A - Surface	9B - 300mm	9C - 500mm
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-017	EB1621816-018	EB1621816-019	EB1621816-020	EB1621816-021
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ 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	340	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	110	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	450	<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
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		126	105	105	122	128
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		129	113	112	107	110
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		110	82.0	96.6	72.1	92.9
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		115	96.1	99.4	85.6	83.6
2-Chlorophenol-D4	93951-73-6	0.5	%		110	90.3	93.7	80.4	77.9
2,4,6-Tribromophenol	118-79-6	0.5	%		72.2	56.8	78.6	66.6	69.7
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		124	114	109	98.1	94.7
Anthracene-d10	1719-06-8	0.5	%		97.7	81.5	96.2	101	98.9
4-Terphenyl-d14	1718-51-0	0.5	%		133	122	116	108	107
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		81.8	80.6	85.1	79.5	78.6
Toluene-D8	2037-26-5	0.2	%		73.6	73.4	78.7	77.2	70.9



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	8B - 300mm	8C - 500mm	9A - Surface	9B - 300mm	9C - 500mm
				Client sampling date / time	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-017	EB1621816-018	EB1621816-019	EB1621816-020	EB1621816-021
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.2	%		88.4	80.6	88.7	88.1	84.2

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	9D - 750mm	10A - Surface	10B - 500mm	10C - 750mm	10 - Side Sample
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-022	EB1621816-023	EB1621816-024	EB1621816-025	EB1621816-026
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		14.5	7.3	4.9	12.4	1.4
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		223	18	5	7	100
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		3	6	3	4	6
Copper	7440-50-8	5	mg/kg		76	<5	<5	<5	22
Lead	7439-92-1	5	mg/kg		24	10	6	10	31
Nickel	7440-02-0	2	mg/kg		8	<2	<2	<2	5
Zinc	7440-66-6	5	mg/kg		122	<5	6	6	76
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID				
Client sampling date / time				9D - 750mm	10A - Surface	10B - 500mm	10C - 750mm	10 - Side Sample
Compound				EB1621816-022	EB1621816-023	EB1621816-024	EB1621816-025	EB1621816-026
CAS Number LOR Unit				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID				
Client sampling date / time				9D - 750mm	10A - Surface	10B - 500mm	10C - 750mm	10 - Side Sample
Compound				EB1621816-022	EB1621816-023	EB1621816-024	EB1621816-025	EB1621816-026
CAS Number LOR Unit				Result	Result	Result	Result	Result
EP075(SIM)A: Phenolic Compounds - Continued								
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	<2	<2	<2
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
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



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	9D - 750mm	10A - Surface	10B - 500mm	10C - 750mm	10 - Side Sample
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-022	EB1621816-023	EB1621816-024	EB1621816-025	EB1621816-026
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ 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
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		115	96.2	107	99.3	126
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		103	103	103	101	119
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		98.0	92.9	82.7	76.1	88.9
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		86.1	84.4	91.9	91.0	87.7
2-Chlorophenol-D4	93951-73-6	0.5	%		83.0	81.3	85.2	84.7	80.6
2,4,6-Tribromophenol	118-79-6	0.5	%		64.6	64.9	75.2	74.3	72.9
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		92.0	91.7	92.2	89.0	88.6
Anthracene-d10	1719-06-8	0.5	%		90.4	88.7	89.7	89.6	85.1
4-Terphenyl-d14	1718-51-0	0.5	%		95.9	95.9	93.0	92.7	89.6
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		81.3	101	84.7	84.3	88.5
Toluene-D8	2037-26-5	0.2	%		71.9	89.9	77.3	75.4	82.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	9D - 750mm	10A - Surface	10B - 500mm	10C - 750mm	10 - Side Sample
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1621816-022	EB1621816-023	EB1621816-024	EB1621816-025	EB1621816-026
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.2	%		91.6	108	89.0	80.8	84.0

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Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	16	134
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	10	138
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	23	135
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	35	155
2-Chlorophenol-D4	93951-73-6	42	153
2,4,6-Tribromophenol	118-79-6	26	157
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	34	157
Anthracene-d10	1719-06-8	37	153
4-Terphenyl-d14	1718-51-0	42	172
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	53	134
Toluene-D8	2037-26-5	60	131
4-Bromofluorobenzene	460-00-4	59	127

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CERTIFICATE OF ANALYSIS

Work Order : **EB1622586**
Client : **CPB CONTRACTORS PTY LTD**
Contact : sch4p4(6) Personal info
Address : TRINITY BUILDING 82 EAGLE ST
 BRISBANE QLD, AUSTRALIA 40
Telephone : ----
Project : GCLR Stage 2
Order number : 4568479
C-O-C number : ----
Sampler : sch4p4(6) Personal information
Site : ----
Quote number : ----
No. of samples received : 18
No. of samples analysed : 18

Page : 1 of 8
Laboratory : Environmental Division Brisbane
Contact :
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 15-Sep-2016 15:08
Date Analysis Commenced : 19-Sep-2016
Issue Date : 23-Sep-2016 09:34



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

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

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

Signatories

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

Signatories

sch4p4(6) Personal information

Position

Senior Inorganic Chemist
 Asbestos Identifier

Accreditation Category

Brisbane Inorganics, Stafford, QLD
 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.

- **This work order has been created to rebatch samples from previous ALS workorders EB1618850 and EB1621816**
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- 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: **DI WATER LEACHATE**
 (Matrix: **WATER**)

Client sample ID

				1A-Surface	2B-300mm	3B-300mm	7A-Surface	8A-Surface
Client sampling date / time				[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit	EB1622586-001	EB1622586-002	EB1622586-003	EB1622586-004	EB1622586-005
				Result	Result	Result	Result	Result
EG005W: Water Leachable Metals by ICPAES								
Arsenic	7440-38-2	0.01	mg/L	<0.01	0.15	0.14	1.14	0.08

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Analytical Results

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

Client sample ID

				9C-500mm	A60 SS01	A60 SS06	----	----
Client sampling date / time				[19-Aug-2016]	[25-Jul-2016]	[25-Jul-2016]	----	----
Compound	CAS Number	LOR	Unit	EB1622586-006	EB1622586-007	EB1622586-008	-----	-----
				Result	Result	Result	----	----
EG005W: Water Leachable Metals by ICPAES								
Arsenic	7440-38-2	0.01	mg/L	0.07	0.10	0.30	----	----

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	1A-Surface	2B-300mm	3B-300mm	7A-Surface	8A-Surface
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1622586-001	EB1622586-002	EB1622586-003	EB1622586-004	EB1622586-005
					Result	Result	Result	Result	Result
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:	----	-	--		----	----	----	----	----
EN60: Bottle Leaching Procedure									
Final pH	----	0.1	pH Unit		6.6	6.5	6.6	6.5	6.6

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	9C-500mm	A60 SS01	A60 SS06	2A-surface	2C-350mm
Client sampling date / time					[19-Aug-2016]	[25-Jul-2016]	[25-Jul-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1622586-006	EB1622586-007	EB1622586-008	EB1622586-009	EB1622586-010
				Result	Result	Result	Result	Result	Result
EA200: AS 4964 - 2004 Identification of Asbestos in Soils									
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	----	----	No	No
Asbestos Type	1332-21-4	-	--	----	----	----	----	-	-
Sample weight (dry)	----	0.01	g	----	----	----	----	282	328
APPROVED IDENTIFIER:	----	-	--	----	----	----	----	sch4p4(6) Personal information	
EN60: Bottle Leaching Procedure									
Final pH	----	0.1	pH Unit		6.7	6.3	6.2	----	----

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	4A-surface	5A-surface	7B-500mm	8B-300mm	9A-surface
Client sampling date / time					[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]	[19-Aug-2016]
Compound	CAS Number	LOR	Unit		EB1622586-011	EB1622586-012	EB1622586-013	EB1622586-014	EB1622586-015
					Result	Result	Result	Result	Result
EA200: AS 4964 - 2004 Identification of Asbestos in Soils									
Asbestos Detected	1332-21-4	0.1	g/kg		No	No	No	No	No
Asbestos Type	1332-21-4	-	--		-	-	-	-	-
Sample weight (dry)	----	0.01	g		150	176	168	147	132
APPROVED IDENTIFIER:	----	-	--		[sch4p4(6) Personal information]				
EN60: Bottle Leaching Procedure									
Final pH	----	0.1	pH Unit		----	----	----	----	----

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	10-side sample	A60-SS02	A60-SS03	----	----
Client sampling date / time					[19-Aug-2016]	[25-Jul-2016]	[25-Jul-2016]	----	----
Compound	CAS Number	LOR	Unit		EB1622586-016	EB1622586-017	EB1622586-018	-----	-----
					Result	Result	Result	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils									
Asbestos Detected	1332-21-4	0.1	g/kg		No	No	No	----	----
Asbestos Type	1332-21-4	-	--		-	-	-	----	----
Sample weight (dry)	----	0.01	g		103	255	177	----	----
APPROVED IDENTIFIER:	----	-	--		sch4p4(6) Personal information			----	----
EN60: Bottle Leaching Procedure									
Final pH	----	0.1	pH Unit		----	----	----	----	----

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	2A-surface - [19-Aug-2016]
EA200: Description	2C-350mm - [19-Aug-2016]
EA200: Description	4A-surface - [19-Aug-2016]
EA200: Description	5A-surface - [19-Aug-2016]
EA200: Description	7B-500mm - [19-Aug-2016]
EA200: Description	8B-300mm - [19-Aug-2016]
EA200: Description	9A-surface - [19-Aug-2016]
EA200: Description	10-side sample - [19-Aug-2016]
EA200: Description	A60-SS02 - [25-Jul-2016]
EA200: Description	A60-SS03 - [25-Jul-2016]