BELMONT DROUGHT RESPONSE DESALINATION PLANT – SUPPLEMENTARY RESPONSE TO SUBMISSIONS REPORT

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1 INTRODUCTION

1.1 Strategic context and need for the Project

Like much of NSW, the Lower Hunter Region experienced severe drought conditions from 2018 to early 2020. In February 2020 Hunter Water's storages reached their lowest level in over 40 years, falling to 52.5%. Water supplies in the Lower Hunter are vulnerable to droughts because storages are relatively small or shallow, and water levels can fall quickly. Modelling of an extreme drought indicates that total water storage levels could drop very quickly from 65 per cent to 15 per cent in only 24 months.

Hunter Water is developing a program of drought response measures as outlined in the Lower Hunter Water Plan 2014 (LHWP). Measures include the staged introduction of water restrictions, implementation of a broad range of water conservation and water loss initiatives, as well as various operational measures.

The 2014 LHWP identified the implementation of emergency desalination as a measure of last resort in response to a severe drought, and would only be implemented if water storage levels reached a critical point and all other measures have been implemented. Investigations undertaken subsequent to the 2014 LHWP identified a 15 million litre per day (ML/day) Drought Response Desalination Plant at Belmont.

Since commencing this Project, Hunter Water has begun a major review of the LHWP, now referred to as the Lower Hunter Water Security Plan (LHWSP). The LHWSP seeks to determine the preferred portfolio of supply and demand side options to ensure a sustainable and resilient supply for the region, over the long term as well as during drought. The LHWSP is a whole of government approach. Hunter Water is working closely with the NSW Department of Planning, Industry and Environment (DPIE) – Water, Central Coast Council, the Lower Hunter community and other stakeholders in developing the new plan.

The LHWSP showed that in the event of a rare and unprecedented drought, resulting in storages approaching empty, there is a predicted shortfall between the network's existing supply capacity and the estimated fully restricted demand. This shortfall is predicted to occur following the implementation of all the measures in the 2014 LHWP, including the 15 ML/day Belmont Drought Response Desalination Plant.

Hunter Water investigated a range of options to close, or partially fill the shortfall in supply, including increased access to groundwater sources (beyond current license limits), additional recycling schemes and increased desalination capacity. This work indicates that a drought response portfolio, including a desalination plant at Belmont with a nominal production capacity of up to 30 ML/day, would provide the best balance of meeting the communities needs should a severe drought occur, while still providing value for money.

1.2 Project Overview

1.2.1 Environmental Impact Statement (EIS) Project

In October 2019 Hunter Water submitted an Environmental Impact Statement (EIS) with the NSW Department of Planning, Industry and Environment (DPIE) seeking planning approval for a Drought Response Desalination Plant at the Belmont site (the EIS Project).

The key features of the EIS Project included:

- Production capacity of up to 15 ML/day of potable water
- Two intake structures to extract raw feed water (seawater) from a sub-surface saline aquifer:
  - Concrete structure (referred to as a caisson) of approximately nine to 11 m diameter and installed to a depth up to 20 m below existing surface levels
  - Intake pipes located approximately eight to 15 m below ground level radiating out from the central structure
  - Pipelines and pumps to transfer the seawater to the desalination plant.
- The waste brine from the desalination process would be transferred via a pipeline to the existing nearby Belmont WWTW for disposal via the existing ocean outfall pipe.

Further details are provided in Section 4 of the EIS.

1.2.2 Amended Project

As the design process for the Belmont Desalination Plant has developed, more information has become available on costs associated with plant components, lead-times for key components, together with construction limitations and costs. This information, in conjunction with further modelling of the system storage capacity, water delivery options and supply constraints, has been used to determine that a drought response portfolio including a desalination plant at Belmont with a nominal production capacity of up to 30 ML/day would provide the best balance of meeting the communities needs should a severe drought occur while still providing value for money.

Concurrent with this reassessment, the LHWSP review has investigated alternative sites that could provide larger desalination production capacities. It found that these alternative sites could not be delivered in the timeframes required to prevent storage depletion under worst-case drought conditions.

The key features of the amended Project include:

- Production capacity of up to 30 ML/day of potable water
- Direct ocean intake:
  - Pipeline constructed beneath the ocean floor by either horizontal directional drilling or micro-tunnelling (pipejacking) to approximately 1000 metres offshore.
  - An off-shore water intake structure in the form of a horizontal intake with a velocity cap structure and low through-screen velocity to minimise impacts on marine species and habitat. The intake structure would be 5 metres in diameter, have a minimum of 4 metres clearance from the seabed and a depth of approximately 18 metres of water.
- The waste brine from the desalination process would be transferred via a pipeline to the existing nearby Belmont WWTW for disposal via the existing ocean outfall pipe.

Further details are provided in Section 3.3 of the combined EIS Amendment Report and Response to Submissions Report.

1.3 Amendment Report and Response to Submissions

Hunter Water prepared a combined EIS Amendment Report and Response to Submissions Report (Amendment Report) seeking planning approval for the Project's amended design. The Amendment Report was submitted to DPIE on 30 June 2020.

The Amendment Report provided a detailed description of the Project's design changes, together with an updated environmental assessment for the proposed design changes. The Amendment Report also provided Hunter Water's responses to the issues raised in submissions from the exhibition of the EIS in November and December 2019.

A number of new environmental studies were completed in the preparation of the Amendment Report, and other studies from the EIS Project were updated, to assess the potential environmental impacts of the Amended Project. These studies are detailed in Sections 3.5 and 3.6 of the Amendment Report.

1.4 Legislative context

The statutory context for the Amended Project is generally consistent with the EIS Project. The Project satisfies Clause 4(1) of the State Environmental Planning Policy (State and Regional Development) 2011 (SEPP SRD), being development for the purpose of desalination plants by or on behalf of a public authority that has a capital investment value of more than $10 million. The Project is therefore State Significant Infrastructure (SSI) (see Section 5.1.3 of the EIS).

As State Significant Infrastructure, the Project is subject to assessment and approval under Division 5.2 of Part 5 of the NSW Environmental Planning and Assessment Act 1979 (EP& Act). Relevant legislation, environmental planning instruments, guidelines, policies, plans and industry codes of practice were considered in the preparation of the EIS and the Amendment Report.

The amended Project would result in disturbance to new areas at the site due to the increase in plant capacity, and the amended seawater intake design. The Amendment Report considered any changes to legislative requirements that were identified and addressed in the EIS. Environmental planning instruments and other legislation relevant to the amended Project were discussed in Section 3.4 of the Amendment Report.

In accordance with the EP&A Act and the NSW Environmental Planning and Assessment Regulation 2000 (the Regulation), all State significant projects must be publicly exhibited for at least 30 days, and applications to modify projects for a minimum of 14 days. Hunter Water requested that the Amendment Report be placed on public exhibition for four weeks in order to give stakeholders adequate opportunity to review the amendments to the Project, and the environmental assessments completed as part of the Amendment Report.

2 STAKEHOLDER ENGAGEMENT

2.1 Stakeholder engagement

Hunter Water is committed to engaging with stakeholders to ensure that the Project's potential impacts are identified, understood, documented and, where possible, avoided or minimised. A Community and Stakeholder Engagement Plan (CSEP) has been used to guide the Project's stakeholder engagement process. Hunter Water has continued to engage with stakeholders during the preparation of the Amendment Report and prior to its exhibition by DPIE.

The engagement process has provided stakeholders with an opportunity to express their views and concerns, to provide feedback and to be involved in the environmental assessment and planning approval process. On-going stakeholder engagement has been an effective way of keeping stakeholders informed of the project's development.

The engagement has also been important in identifying any potential stakeholders that may be affected by the amended design that may not have been by the EIS Project. Hunter Water contacted potential stakeholders that may have an interest in, or be affected by, the amended Project and offered the opportunity to make comment or seek additional information.

Hunter Water's stakeholder engagement activities have included:

- Letters sent to Lake Macquarie City Council and State Government agencies notifying them of the Project amendments and the plan to submit the Amendment Report to DPIE seeking planning approval for the Amended Project

- Due to COVID19 social distancing requirements, video briefings were held with Lake Macquarie City Council and State Government agencies in lieu of Planning Focus Meetings.

- Project information uploaded to Hunter Waters' Your Voice website: https://yourvoice.hunterwater.com.au/desal.

- Letterbox drop to surrounding properties containing an information brochure together with contact information for the Hunter Water project team.

- Hard copies of the Amendment Report were placed in public locations such as Lake Macquarie City Council libraries, Newcastle Library, and Hunter Water properties.

- Community drop-in sessions were not available due to COVID-19 social distancing restrictions. In lieu of the drop-in sessions, Hunter Water conducted video briefings for members of the public.

- Hunter Water continues to provide project updates via the Your Voice website - http://www.yourvoice.hunterwater.com.au/desal and through media releases.

3 SUBMISSIONS REPORT

3.1 Exhibition of the Amendment Report

DPIE placed the Amendment Report on public exhibition on the DPIE Major Projects website for four weeks, from 10 September 2020 to 7 October 2020. A total of 14 submissions were received as follows:

- 11 from public authorities
- Two from members of the public
- One from an organisation.

In addition to the 11 submissions received from public authorities, DPIE provided a letter seeking clarification and additional information. Of the 14 submissions received there were no objections. Two submissions were in support of the Project, and 12 submissions were comments.

Table 3-1 lists the submissions that were received. Copies of public authority submissions are provided in Appendix A. Copies of submissions from members of the public are provided in Appendix B, and the submission received from the organisation is provided in Appendix C.

Table 3-1 Overview of submissions received

Submission Number	Submitter	Type	Support, object or comment
1	Lake Macquarie City Council	Public authority	Comment
2	NSW Department of Planning, Industry and Environment (DPIE Water) and National Resource Access Regulator (NRAR)	Public authority	Comment
3	Hunter New England Health	Public authority	Comment
4	Transport for NSW (TfNSW)	Public authority	Comment
5	Roads and Maritime Services (RMS)	Public authority	Comment
6	Heritage NSW – Aboriginal heritage	Public authority	Comment
7	Heritage NSW – non-Aboriginal heritage	Public authority	Comment

8	NSW Environment Protection Authority (EPA)	Public authority	Comment
9	Biodiversity Conservation Division (BCD)	Public authority	Comment
10	DPIE Crown Lands	Public authority	Comment
11	Department of Primary Industry – Fisheries	Public authority	Comment
12	John Mills, Rankin Park	Member of the public	Support (provisional)
13	Mike Blayney, Eleebana	Member of the public	Comment
14	Fluence	Organisation	Support

3.2 Structure of the response to submissions

Section 4.1 of the DPIE guideline document titled Responding to Submissions – Draft Environmental Impact Assessment Guidance Series (June 2017) suggests that the response to submissions should group and address submissions by issue or location rather than on an individual or stakeholder basis. However footnote 17 states that “*If only a small number of submissions have been received, it may be appropriate to respond to issues on an individual or stakeholder basis*”.

Given the relatively low number of submissions, the majority of submissions coming from public authorities and with no objections, this Supplementary Submissions Report has been structured to respond to submissions on a stakeholder basis.

Section 3.3 provides Hunter Water’s response to submissions received from public authorities and DPIE’s letter. Section 3.4 provides Hunter Water’s response to submissions received from members of the public, and Section 3.5 provides Hunter Water’s response to submissions received from organisations.

3.3 Response to public authority submissions

Eleven submissions were received from public authorities. All letters were classed as comments, and no objections were received. In addition to the 11 submissions received from public authorities, DPIE sent Hunter Water a letter request for further information on the environmental assessment. Hunter Water’s detailed response to DPIE’s letter is provided in Appendix D.

Submissions received from public authorities and the DPIE letter, together with Hunter Water’s responses, are provided in Table 3-2. Copies of the submissions received from public authorities and the DPIE letter are provided in Appendix A.

Table 3-2 Response to public authority submissions

Submission	Hunter Water Response
Submitter: DPIE	
Consistency and relevance across documentation *“There are inconsistencies across the supplementary technical reports provided to support the preferred project (i.e. some reports provide a comprehensive list of mitigation measures that apply to the whole preferred project, some provide the measures that apply to the amended sections only, some provide a full revised report and some provide an addendum report).* *The Department requests that reports are made consistent or that a comprehensive summary document be provided that clearly stipulates all sections of the EIS and associated appendices that remain relevant and applicable to the preferred project as a whole.”*	**Mitigation measures** A comprehensive and consolidated list of mitigation measures for the Amended Project are provided in Appendix E of the Amendment Report. **Consistency across reports** The DPIE letter sought clarification on which elements of the environmental assessment in the EIS are no longer relevant. It requested confirmation on which elements of the Amended Project have been assessed in the Amendment Report and therefore supersedes the environmental assessment completed in the EIS. Hunter Water has prepared a Summary Document in response to the issues raised in DPIE’s letter. This response is provided in Appendix D. The Summary Document provides clarity on the EIS sections that remain relevant and applicable, and the sections of the Amendment Report that supersede the other sections of the EIS.
Buildings and hardstand	**Buildings and hardstand**

Submission	Hunter Water Response
“A summary of the areas of hardstand areas, buildings (height, area, materials) and roof areas of the desalination plant are to be provided. This should also include detail of the management of surface water/stormwater flows and flows associated with any overtopping during king tide events and 1 in 100 rainfall events”.	The following dimensions of the Project’s buildings and hardstand areas are indicative only. Whilst it is not anticipated that there will be significant changes, these indicative values for the building layouts, heights and hardstand areas would be confirmed at the detailed design stage. The total hardstand areas would be approximately 6,300 m^2. The total building footprint and total roof area would be approximately 6,900 m^2. The tallest structure on site would be the ultra-filtration reverse osmosis (UF/RO) process building, which would be 14 metres tall. Buildings would generally be constructed of pre-formed concrete panels, bricks, colorbond metal roofing and wall sections, and other standard building products. **Surface water and stormwater management** A stormwater basin has been incorporated into the Project’s design to manage surface and stormwater flows from impervious surfaces. The basin has been designed to accommodate flows from a 1 in 100 year Annual Recurrence Interval storm event (1-100 ARI). A swale on the southern and eastern sides of the water treatment process plant would direct surface flows to the north east to the stormwater basin. Stormwater flows higher than the capacity of the stormwater basin would flow to the east and infiltrate within the sand. The dune system would prevent direct runoff into the ocean. **Flows associated with overtopping from inundation** Mapping prepared for the Lake Macquarie City Council *Coastal Zone Management Plan 2015* (CZMP 2015) shows that all infrastructure associated with the Project would be located landward of the current designated risk areas, and would therefore not be deemed at risk of coastal inundation.

Submission	Hunter Water Response
	The CZMP 2015 shows the modelling of coastal hazards for the years 2050 and 2100. These models show that for the years 2050 and 2100 during a 1% annual exceedance probability (AEP) weather event, overtopping of the foredunes could occur on the eastern side of the Project near the seawater pump station. This would be in the form of waves passing over the dunes. This water would disperse by draining towards Belmont Lagoon, or infiltrate into the sand. This process would be expected to occur even if the Project was not constructed, and the Project would not exacerbate this process. The Belmont Dune Restoration Project (separate to the proposed Desalination Plant Project) would stabilise the dunes between the Belmont Golf Course to the south and the Belmont WWTW to the north. This would minimise erosion and limit the impacts of inundation from waves overtopping the dunes.
Mitigation measures *"The Department requests a table of detailed mitigation measures that will be implemented as part of the preferred project. It is not considered sufficient to refer to the measures provided within technical reports. Mitigation measures must be clearly consolidated and committed to by the applicant".*	Appendix E of the Amendment Report provides a table of consolidated mitigation measures that will be implemented as part of the preferred project.
Additional Information *"The Department also requests the following information:* • *Details of the decommissioning of the evaporation ponds, including year and detail of any approvals obtained.* • *Consideration of stormwater flows during construction and operation.*	**Decommissioning of evaporation ponds** Decommissioning of the evaporation ponds, including emptying of residual contents, was completed in the mid to late 1990s. The ponds were decommissioned due to technology upgrades at the treatment plant when belt presses were installed. **Stormwater** • During construction stormwater would be managed in accordance with

Submission	Hunter Water Response
- *Details of car parking to be provided during construction and operation.* - *Confirmation of the depth of the sea water shaft – there are conflicting depths in documentation provided.* - *Detail of the 'groundwater treatment system' that will be utilised during shaft installation.* - *Details of the "liner type storage tanks" that would be established during construction (ie. number, size, location).* *Confirmation that the entirety of the brine pipeline would be contained within the Hunter Water owned land. This should consider the submission/s received from Crown Lands.*	the requirements of *Managing Urban Stormwater. Soils and Construction – Volume 2A, Installation of Services* (DECC, 2008a) and *Managing Urban Stormwater. Soils and Construction, 4th ed* (Landcom 2004). - During operation a stormwater basin has been designed to manage surface and stormwater flows from impervious surfaces. The basin has been designed to accommodate flows from a 1 in 100 year Annual Recurrence Interval storm event (1-100 ARI). A swale on the southern and eastern sides of the water treatment process plant would direct surface flows to the stormwater basin to the north east. Stormwater flows higher than the capacity of the stormwater basin would flow to the east and infiltrate within the sand. The dune system would prevent direct runoff into the ocean. **Car parking** - During construction car parking is to be provided within the Project site. Car parking space will be available in the main compound area to the south of the water treatment process plant, and in a temporary car park to the north of the water treatment process plant. There is adequate space for construction workers' vehicles. No off-site parking, such as on Ocean Park Road, will be required during construction. - During operation car parking will be available in the existing administration car park to the north of the potable water tanks. No off-site parking, such as on Ocean Park Road, will be required during operation. **Depth of seawater shaft** The intake structure (seawater shaft) would be a vertical concrete shaft installed in the ocean. It would connect the intake structure in the ocean with the direct ocean intake (DOI) pipeline below the seafloor. The depth of the seawater shaft would depend on which construction methodology is selected at the detailed design stage.

Submission	Hunter Water Response
	If micro-tunnelling is selected the depth of the sea water shaft would be constructed approximately nine metres into the seabed and would raise about five metres above the seabed where the intake screen would be attached. If horizontal directional drilling (HDD) is selected, the depth of the sea water shaft would be approximately seven metres into the seabed and would raise about five metres above the seabed where the intake screen would be attached. **Seawater pump station** The proposed direct ocean intake (DOI) pipeline would be installed by one of two potential construction methods. These are horizontal directional drilling and micro-tunnelling. Each of these methods involves construction of a vertical seawater pump station wet well. The seawater pump station would be a vertical concrete wet well constructed on the Site between the water treatment process plant buildings and the foredunes. The diameter and depth of the seawater pump station wet well would be determined at detailed design stage, and would depend on the preferred construction methodology for the DOI pipeline. If micro-tunnelling is selected a deeper wet well would be required to allow the tunnelling equipment to be lowered into place. The environmental assessment was completed using a worst-case scenario in terms of wet well diameter and depth. The environmental assessment was completed based on a wet well diameter of nine metres and a depth of 20 metres. This scenario makes allowance for a possible deeper and wider wet well if the detailed design finds construction of a second DOI pipeline is required. This wet well size is unlikely to be required, but has been used as a conservative design to assess worst case scenario groundwater inflows and de-watering, and sand displacement.

Submission	Hunter Water Response
	Groundwater treatment system During construction, groundwater would be restricted from entering the seawater pump station wet well by sheet piles or similar barriers installed into the wet well walls. De-watering of the shaft would be completed using pumps. The extracted water would be continually tested for salinity. Fresh water would be distributed across the land surface in an adjoining area and allowed to infiltrate through the sand. Any saline water would be re-directed to the Belmont WWTW and disposed back into the ocean via the WWTW outfall pipe. This would be done in accordance with a new Environment Protection Licence (EPL), or if an amendment to the existing EPL 1771 is obtained. **Storage tanks** Storage tanks are proposed to be above ground tanks. The treated water storage tank would be the largest tank proposed at 4ML capacity. It is proposed to be steel panel with an epoxy coating, containing a heavy duty PVC liner. This would be confirmed at the detailed design stage. Other storage tanks would range in application from chemical storage, backwash, feed and surge tanks. The proposed materials would vary depending on intended use. **Brine pipeline location** The brine pipeline would connect the Project with the existing Belmont WWTW and would be located on Hunter Water land. The existing Belmont WWTW outfall pipeline is subject to application for easement currently underway with Crown Lands.

Submission	Hunter Water Response
Submitter: Lake Macquarie City Council	
Environmental planning: *"The modification to avoid ground water drawdown on the Belmont Lagoon and surrounding wetland is supported.* *Issues associated any (sic) bycatch from drawing in ocean water should be addressed."*	**Groundwater** Noted. **Bycatch** The intake structure would include measures to reduce potential entrainment of marine fauna (resulting in bycatch). Measures include utilising a cap to reduce the velocities of the water entering the intake, and a coarse screen allowing the free movement of fish, but reducing the potential for eggs and larvae to be entrained. Larvae and eggs may be entrained at low numbers. This is largely due to the absence of suitable habitat in the immediately surrounding environment. Any eggs or larvae that are entrained would be captured in the pre-treatment filtering process and disposed via the WWTW outfall.
Erosion and sediment control *"The Belmont Drought Response Desalination Plant Submissions and Amendment Report dated August 2020 has addressed earlier concerns. The proposed erosion and sediment control actions are in accordance with the DCP."*	Noted
Visual amenity *"The site is adjacent to a number of important recreational and tourist places and facilities for Lake Macquarie City. The Visual Impact Assessment (VIA) findings are supported, however the mitigation*	A Native Vegetation Restoration Plan will be prepared by a qualified landscape architect and ecologists as part of the Project's detailed design. The detailed design will include treatments to minimise the visual impact of the built forms, including vertical elements and appropriate colour choices.

Submission	Hunter Water Response
measures for the site are not as they do not include any revegetation that addresses the visual impacts. Addressing the identified visual impacts from Nine Mile Beach and the western track brings multiple benefits to the site and broader environment that reflects positively on Lake Macquarie City. The VIA discusses the future Hunter Water plans for dune restoration and revegetation for the adjoining WWTP site, however this does not include the current site. *The following conditions are recommended:* • *A landscape restoration plan is to be prepared by a qualified landscape architect that includes concept and construction level documentation for revegetation of the dunal system (eastern boundary), northern and southern perimeter, and identifying planting opportunities along the western boundary.* • *The landscape documentation is to be informed by the visual impact assessment and biodiversity reports for the project and maximise opportunities for visual fragmentation and/or screening of the site from the east and west.* • *The landscape works are to be undertaken concurrently with the construction of the facility and maintained in perpetuity.* *The colours of the vertical elements on the site are to be visually recessive and include the darker greys and browns."*	The Native Vegetation Restoration Plan will be incorporated into the Project's Environmental Management Plan. It will be informed by the visual impact assessment and biodiversity reports and will maximise opportunities for screening views of the site. The Native Vegetation Restoration Plan will include concept and construction level documentation for revegetation of the dunal system (eastern boundary), northern and southern perimeter, and will identify planting opportunities along the western boundary. Landscaping works will take place concurrently with the construction of the facility and will be maintained appropriately.
Environmental amenity *"Council's previous submission comments are noted."*	Noted

Submission	Hunter Water Response
Noise: *"A Noise and Vibration Assessment Report has been prepared by GHD, dated November 2019.* *The report has assessed the potential noise and vibration from construction and operation of the proposed project in accordance with the requirements and guidelines of the NSW EPA, and provided recommendations to mitigate impacts on the nearest receivers."*	Noted
***Contamination**:* *"A Contamination Assessment Report has been prepared GHD, dated November 2019.* *The assessment reported contamination in the soil and on the soil surface and determined that, at this stage, no significant human health or environmental risks to construction workers or future site users were identified. The report recommends a Contamination Soil Management Plan (CSMP) be developed as part of the Construction Environmental Management Plan. The CSMP will also deal with unexploded ordnances."*	Hunter Water completed a Detailed Site Investigation (DSI) in October 2020. The DSI was completed in response to the submission received from the EPA after exhibition of the EIS in 2019. The EPA's submission required that a DSI be completed prior to construction. DPIE requested that Hunter Water complete the DSI prior to determination of the planning approval. This request was made so that potential timing issues could be avoided. Potential timing issues may include the discovery of significant contamination delaying the commencement of construction and placing the program at risk. The DSI confirmed that there is no significant contamination at the site that would pose a risk to human health or the environment. Minor contamination that was detected is consistent with surrounding sites. This would be managed by mitigation and management measures that would be incorporated into a Contamination Site Management Plan (CSMP). The CSMP will be prepared as part of the Construction Environmental Management Plan prior to construction at the detailed design stage. The DSI is provided in Appendix E. The CSMP will also deal with unexploded ordnances.

Submission	Hunter Water Response
Flooding: *"Minimum floor level for the development should be 2.36m AHD.* *All unsealed electrical installations associated with the proposed development i.e. pumps, switches, power points, motors etc, should comply with the protection against electrical shock provisions for damp situations outlined in Australian Standard AS 3000 'Australian/New Zealand wiring rules'."*	The detailed design will establish the minimum floor level for the buildings. The design of the minimum floor level will meet safety and Building Code of Australia requirements, as a minimum. All electrical elements of the Project will be designed and constructed to meet relevant Australian Standards applicable at the time, as a minimum.
Heritage *"The application includes an Aboriginal Cultural Heritage Assessment in accordance with OEH (BCD) requirements, which include appropriate recommendations."*	Noted
Lake and Foreshore Impacts: *"Section 3.4.1 of the Belmont Drought Response Desalination Plant Submissions and Amendment Report addresses clauses in the SEPP (Coastal Management) but does not appear to consider clause 15 of the SEPP.* *Council also seeks clarification on the detail of the intake structure pipeline. In particular, we wish to ensure that this pipeline is installed at an adequate depth below the sea-bed to ensure that it does not result in altered sand movements in either near-shore or off-shore area. Council studies identified a high amount of submerged sand movement along 9-Mile Beach and we wish to ensure the pipeline construction caters for future changes in the near & off-shore profile and does not interfere with*	**Clause 15 of the State Environmental Planning Policy (Coastal Management 2018)** Clause 15 states *"Development in coastal zone generally—development not to increase risk of coastal hazards.* *Development consent must not be granted to development on land within the coastal zone unless the consent authority is satisfied that the proposed development is not likely to cause increased risk of coastal hazards on that land or other land."* The Project would not increase the risk of coastal hazards on the subject property, or on other land. All infrastructure would be located outside of the

Submission	Hunter Water Response
sand movement patterns. We also wish to confirm the amount of sand that will be removed by the direct drilling process, and the proposed disposal location for this material. *The Belmont Drought Response Desalination Plant Submissions and Amendment Report (section 3.5.1) indicates that no further assessment is required regarding marine biodiversity impacts. Council remained concerned over the potential impacts on marine biodiversity, particularly larval impacts related to the operation of the intake structure. We suggest that an ongoing monitoring program is warranted to assess these impacts should the project be approved."*	areas designated as high risk under the Lake Macquarie City Council Coastal Zone Management Plan 2015. Potential erosion impacts during construction would be minor and temporary. These would be managed by appropriate management and mitigation measures. The Project would be located behind the foredunes, and would not restrict the availability of the dunal sand by constructing on it. The Project would not change the current availability and movement of dunal sand in this location. The Project would not increase the risk of coastal inundation on the site, or on adjoining sites. Hunter Water is undertaking a separate project to restore the foredunes between the adjoining Hunter Water Belmont Waste Water Treatment Works site to the north, and the Belmont Golf Course approximately 650 metres to the south. This project has involved dune protection and restoration works to stabilise and rehabilitate the dunal system in this area. **Seawater pump station** The seawater pump station would be a vertical concrete shaft constructed on the Site between the desalination buildings and the foredunes. The diameter and depth of the of the seawater pump station shaft would be determined at detailed design stage, and would depend on the preferred construction methodology for the DOI pipeline. **Intake Structure Pipeline** The DOI pipeline would be installed by one of two potential construction methods. These are micro-tunnelling (also known as pipe-jacking) and horizontal directional drilling (HDD).

Submission	Hunter Water Response
	If micro-tunnelling is selected the sea water shaft would be constructed approximately nine metres into the seabed and would raise about five metres above the seabed where the intake screen would be attached. If the micro-tunnelling method is used there would be approximately five metres of cover above the DOI pipeline for the majority of this distance. The DOI pipeline would connect with the intake structure below the seafloor surface and would not be exposed. If horizontal directional drilling (HDD) is selected, the depth of the sea water shaft would be approximately four metres deep, and would raise about five metres above the seabed where the intake screen would be attached. If the HDD construction method is used there would be approximately 10 metres of cover above the DOI pipeline for the majority of this distance. At the connection point with the intake structure, the DOI pipeline would sit on the seafloor for about 40 metres if the HDD method is used. **Sand movement patterns** The intake structure would be circular, with a diameter of no more than five metres. The structure would sit a minimum of five metres above the seafloor. Field measurements taken with Acoustic Doppler Current Profiler showed that the velocities of currents at the proposed intake structure location are higher in the north to south axis (longshore) compared to the east to west axis (cross-shore). The measurements also noted that velocities were higher at the surface and mid depths for the longshore currents when compared to the seafloor. The seafloor is at a depth of 18 metres at this location. Velocities were similar at all depths for the cross-shore currents. Using the velocities taken from the field measurements, modelling shows that the lower velocities at the seafloor depth of 18 metres would not produce significant risks of scour at the intake location, or pose significant impediments to longshore sand transportation.

Submission	Hunter Water Response
	Sand disposal The construction of the DOI and seawater pump station would result in approximately 4,400 cubic metres of sand being removed. This is based on the conservative dimensions of the seawater pump station shaft of nine metres diameter and 20 metres deep. This sand is planned to be used as fill on the site. This would mean that the DOI would need to be constructed earlier in the construction phase. Other possible uses for this sand, such as beach re-nourishment, would be determined at the detailed design stage. **Marine biodiversity impacts** Hunter Water would continue the Ocean Outfall Benthic Monitoring Program it conducts in accordance with EPL 1771. Additional monitoring would be implemented for the seawater intake structure for the first three years of the Project's operation. This monitoring would include fish assemblages and pipeline ecology monitoring. The program would monitor and evaluate the intake structure for entrainment of aquatic biota, or other potential impacts. Where feasible, improvements would be made to the screen and other elements of the intake structure to reduce any impacts.
Council assets – roads *"Ocean Park Road Belmont South has failed due to heavy vehicles gaining access to the nearby treatment works and beach access. Asset Management will require the road from Green Street to the main access gate to Hunter Water land to be reconstructed.* *Council has undertaken a pavement investigation of the road and it was identified that asbestos was observed. This material imposes a level of*	***Roads*** Lake Macquarie City Council is the owner of Ocean Park Road. Hunter Water will work closely with Lake Macquarie City Council to determine the appropriate design and construction requirements to ensure the safety of all road users, particularly during construction of the Project.

Submission	Hunter Water Response
complexity into construction, which means the road will require a granular overlay 300-400mm thick and sealed to meet expect (sic) vehicle usage. *As part of these works stormwater will need to be catered for, that will require additional drainage into the sand dunes. Due to potential Aboriginal artefacts being present, an impact study will be required for where the water discharge is likely to occur.* *Further consultation with Council's Sustainability section will be required regarding the formalisation of beach access in this immediate area."*	
Engineering ***Stormwater management:*** *"A suitable Stormwater Management Plan by GHD P/L Drg. 2219573 incorporating water harvesting, water quality facilities and site discharge index requirements in accordance with the Lake Macquarie DCP 2014 has been provided."*	***Stormwater management*** Noted
Natural water systems: *"The proposed development is located (within the vicinity of/adjacent to) Belmont Lagoon and the Pacific Ocean, which are considered natural water bodies. The Stormwater Management Plan prepared by GHD P/L Drg. 2219573 has incorporated facilities which will eliminate or limit any likely adverse effects on the water body and/or ecosystem adjacent or downstream receiving waters. It is therefore considered that the development as proposed will have no significant adverse impacts."*	Noted

Submission	Hunter Water Response
Design of Parking and Service Areas ***Parking:*** *"The internal driveway and car parking area (including turning movements) for the development appear adequate for the development and comply with the DCP 2014 requirements and AS 2890.1 Parking Facilities – Off Street Parking & AS 2890.6 Parking Facilities – Off Street Parking for People with Disabilities."*	Noted
Servicing: *"The proposed development has included adequate facilities for service vehicles."*	Noted
Construction Management Plan *"A Construction Management Plan should be required and fencing provided along the western side of the site providing a barrier to the neighbouring wetlands and Belmont Lagoon.* *The Construction Management Plan should specifically address avoiding impacts on the native vegetation to the west of Ocean Park Road. This would include avoiding impacts that might arise from use of the road to access the site or upgrading the road."*	A Construction Environment Management Plan (CEMP) will be prepared prior to the commencement of construction. The CEMP will contain provisions for fencing, including around the perimeter of the site, including along Ocean Park Road. Temporary fencing will be provided along the western boundary of the site, including Ocean Park Road, to prevent vehicle and machinery accessing areas of native vegetation. Temporary fencing will also be designed to prevent native ground fauna from entering construction areas. Temporary fencing will be provided to the west of Ocean Park Road, to prevent vehicle and machinery accessing areas of native vegetation.

Submission	Hunter Water Response
Submitter: NSW Department of Planning, Industry and Environment (DPIE Water) and National Resource Access Regulator (NRAR)	
Prior to approval ***Groundwater flow management:*** - *"Inform DPIE-Water of the maximum volume of groundwater inflow predicted for the final design construction method selected.* - *Detail the method estimation for the maximum volume of groundwater inflow predicted for the final design construction method selected.* - *Should the proponent commit to re-injection of the fresh groundwater back into the coastal sand aquifer further detail outlining this approach is to be submitted to DPIE-Water prior to the commencement of these activities.* - *Outline how a Water Access Licence (WAL) will be acquired to account for the maximum volume of groundwater inflow predicted for the final design construction method selected.* *Note: these four recommendations may be submitted as parts of a dewatering management plan for the final design construction method selected."*	***Groundwater inflow:*** The proposed direct ocean intake (DOI) pipeline would be installed by one of two potential construction methods. These are horizontal directional drilling and micro-tunnelling. Each of these methods involves construction of a vertical seawater pump station wet well. The seawater pump station would be a vertical concrete wet well constructed on the Site between the water treatment process buildings and the foredunes. The diameter and depth of the of the seawater pump station wet well would be determined at detailed design stage, and would depend on the preferred construction methodology for the DOI pipeline. If micro-tunnelling is selected a deeper wet well would be required to allow the tunnelling equipment to be lowered into place. The environmental assessment was completed using a worst-case scenario in terms of wet well diameter and depth. The environmental assessment was completed based on a wet well diameter of nine metres and a depth of 20 metres. This scenario makes allowance for a possible deeper and wider wet well if the detailed design finds construction of a second DOI pipeline is required. This wet well size is unlikely to be required, but has been used as a conservative design to assess worst case scenario groundwater inflows and de-watering, and sand displacement. The maximum volume of groundwater that would require dewatering would be 3,047 ML if the micro-tunnelling construction method is used. Groundwater would be excluded from entering the wet well during construction as far as possible. Sheet piling, cut-off walls or similar would be installed to provide structural support for the excavations, and to limit the volume of groundwater entering the excavations.

Submission	Hunter Water Response
	Groundwater inflow estimation method The groundwater inflow was estimated using the Kavvadas et al method (1991). The Kavvadas method is an analytical solution for estimating groundwater inflow from an unconfined aquifer into an excavation where cut-off walls are present at the side of an excavation. The solution has been verified by more complex numerical models. The solution assumes a simple rectangular excavation of width with identical impermeable cut-off walls on all sides extending to a known depth below the base of the excavation. The solution estimates groundwater flow into the base of the excavation. The method is conservative in terms of estimating flow rate since it assumes there is no drawdown of the external groundwater level. **Groundwater disposal** Electrical conductivity testing will be continually undertaken during de-watering to determine the salinity of the groundwater at varying depths. Where the extracted groundwater is fresh, it will be directed to an infiltration area that will be established during construction. The infiltration area will have bunds or similar installed to restrict groundwater from flowing off-site. Where the extracted groundwater is saline it will be directed via pipeline to the Belmont WWTW for disposal to the ocean. This would be done in accordance with a new Environment Protection Licence (EPL), or if an amendment to the existing EPL 1771 is obtained. **Water Access Licence** Hunter Water will prepare the application for a Water Access Licence at the detailed design stage when the DOI pipeline construction method is selected.

Submission	Hunter Water Response
Acid Sulphate Soil Management Plan *"Prepare and submit an acid sulphate soil management plan to DPIE-Water.*	Hunter Water will prepare an Acid Sulphate Soil Management Plan (ASSMP) at the detailed design stage. The ASSMP will form part of the Project's Environmental Management Plan.
Post approval *"Any WAL required must be obtained from NRAR to account for groundwater inflows and/or take from the Groundwater Source prior to any take of water occurring."*	Hunter Water will obtain any required permits or licences, including a Water Access Licence (WAL), prior to construction.
Submitter: Hunter New England Health	
"The Response to Submissions (RTS) has been reviewed in conjunction with the Preferred Infrastructure Report (PIR) with particular attention being paid to our previous concerns with water quality, noise and community consultation. The review of the RTS/PIR indicates that the amended proposal is likely to have minimal impact on public health. *It is noted that the water would be treated to meeting drinking water requirements prior to being delivered to the water supply network. It is paramount that NSW Health and NSW Department of Planning, Industry and Environment (DPIE) water are consulted throughout all stages to ensure safe drinking water is delivered to the public."*	Noted

Submission	Hunter Water Response
Submitter: Transport for NSW (TfNSW)	
"*Transport for NSW (TfNSW) advises that legislation to dissolve Roads and Maritime Services and transfer its assets, rights a liabilities to TfNSW came into effect on 1 December 2019. It is intended that the new structure will enable TfNSW to deliver more integrated transport services across modes and better outcomes to customers and communities across NSW.* *For convenience, correspondence, advice or submissions made to or by Roads and Maritime Services prior to its dissolution, are referred to in this letter as having been made to or by TfNSW.* *On 08 September 2020 TfNSW accepted the referral by the Department of Planning, Industry and Environment (DPIE) Planning Portal regarding the abovementioned Submissions and Amendments Report (the Report). DPIE referred the Report to TfNSW for comment. This letter is a submission in response to that referral."* ***TfNSW response and requirements*** *"TfNSW's primary interests are in the road network, traffic and broader transport issues. In particular, the efficiency and safety of the classified road network, the security of property assets and the integration of land use and transport.* *The Pacific Highway (A43) is a classified State road, and Beach Street and Ocean Park Road are local roads. Council is the roads authority for both roads and all other public roads in the area, in accordance with Section 7 of the Roads Act 1993.*	Noted

Submission	Hunter Water Response
TfNSW have reviewed the Belmont Drought Response Desalination Plant Submissions and Amendments Report prepared by GHD and dated August 2020, and its appendices, including Appendix P Traffic Assessment dated 29 June 2020 and raises no objections to or requirements for the proposed development as it is considered there will be no significant impact on the nearby classified (State) road network."	
Submitter: Roads and Maritime Services (RMS)	
"Transport for NSW (TfNSW) advises that legislation to dissolve Roads and Maritime Services and transfer its assets, rights a liabilities to TfNSW came into effect on 1 December 2019. It is intended that the new structure will enable TfNSW to deliver more integrated transport services across modes and better outcomes to customers and communities across NSW. *For convenience, correspondence, advice or submissions made to or by Roads and Maritime Services prior to its dissolution, are referred to in this letter as having been made to or by TfNSW."*	Hunter Water's response is provided in the response to the submission from Transport for NSW.
Submitter: Heritage NSW – Aboriginal heritage	
The Biodiversity Conservation Division (BCD) of the Department of Planning, Industry and Environment (DPIE) previously provided comments on this proposal on 13 December 2019 (DOC19/1018918-8), at which time it was advised that the suppled Environmental Impact Statement (EIS) and Aboriginal Cultural Heritage Assessment Report (ACHAR) did not adequately address the SEARs issued for the project	Noted

Submission	Hunter Water Response
by providing adequate management measures for proposed impacts to Aboriginal cultural heritage. *As the office now responsible for the regulation of Aboriginal cultural heritage, Heritage NSW (HNSW) of the Department of the Premier and Cabinet (DPC) have reviewed the supplied Addendum to the Aboriginal Cultural Heritage Assessment Report (RPS 2020) and have determined that the document sufficiently addresses the issues raised in the previous comments.* *However, it should be noted that Section 8: Management and Mitigation (page 12 of the report) which specifies an AHIP (Aboriginal Heritage Impact Permit) may be required prior to impacting a site, should be revised and corrected. To clarify, an AHIP is a statutory instrument issued under Part 6 of the National Parks and Wildlife Act 1976 (NP&W Act) and does not apply to the current project, which is being assessed under separate legislation, Part 5.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act) as a Major Project, State Significant Infrastructure (SSI).”*	
Submitter: Heritage NSW – non-Aboriginal heritage	
“*The subject site is not listed on the State Heritage Register (SHR), nor is it in the immediate vicinity of and SHR items. Further, the site does not contain any known historical archaeological deposits. Therefore, no further heritage comments are required. The Department does not need to refer subsequent stages of this proposal to the Heritage Council of NSW.”*	Noted

Submission	Hunter Water Response
Submitter: NSW Environment Protection Authority (EPA)	
"Reference is made to the EPA's letter of 19 December 2019 to DPIE providing recommended conditions for the proposal. The EPA has reviewed the PIR and RtS and makes no changes to the recommended conditions provided in Attachment A of its letter dated 19 December 2019."	Noted
Submitter: Biodiversity Conservation Division (BCD)	
"The Biodiversity Conservation Division (BCD) has reviewed the 'Belmont Drought Response Desalination Plant Submissions and Amendment Report' (prepared by GHD for Hunter Water Corporation, and dated August 2020), including relevant appendices, annexures and attachments in relation to impacts on biodiversity and flooding. *BCD's recommendations are provided in Attachment A, and detailed comments are provided in Attachment B."* ***Attachment A – Recommendations:*** *Biodiversity* *1. "BCD is satisfied that the RTS report has satisfactorily addressed our previous biodiversity comment (dated 13 December 2019) and no further biodiversity assessment is required.* *Coastal Management*	Noted

Submission	Hunter Water Response
2. BCD is satisfied that the RTS report has satisfactorily addressed our previous coastal comments and no further coastal assessment is required.	
Attachment B – Detailed Comments *Biodiversity* *"BCD is satisfied with the biodiversity assessment."* *Recommendation 1 - "BCD is satisfied that the RTS report has satisfactorily addressed our previous biodiversity comment (dated 13 December 2019) and no further biodiversity assessment is required.* *Coastal Management* *"BCD is satisfied with the coastal assessment."* *Recommendation 2 – "BCD is satisfied that the report has satisfactorily addressed our previous coastal comments and no further coastal assessment is required."*	Noted
Submitter: DPIE Crown Lands	
"The existing ocean outfall pipe occupies Crown land between the mean high water mark and a position approximately 1.5km offshore. The PEA does not contain information relating to an existing authorisation to occupy this Crown land under the Crown Land Management Act 2016, or a legislative exemption, for the outfall pipe. The Department has no record of an easement or other approval for the ocean outfall pipe.	Hunter Water has commenced proceedings to have the existing Belmont WWTW ocean outfall pipeline surveyed to complete a Plan of Easement. Hunter Water has submitted an application to affect the closure or purchase of the Crown Road.

Submission	Hunter Water Response
It is noted that Hunter Water has requested the closure and purchase of the affected Crown road."	
Submitter: Department of Primary Industry – Fisheries	
"DPI Fisheries is responsible for ensuring that fish stocks are conserved and that there is no net loss of key fish habitats upon which they depend. To achieve this, DPI Fisheries ensures that developments comply with the requirements of the Fisheries Management Act 1994 (FM Act) (namely the aquatic habitat protection and threatened species conservation provisions in Parts 7 and 7A of the Act respectively), and the associated Policy and Guidelines for Fish Habitat Conservation and Management (2013). DPI Fisheries is also responsible for ensuring the sustainable management of commercial, recreational and Aboriginal cultural fishing, aquaculture, Marine Parks and Aquatic Reserves in NSW. *The Department has reviewed the Response to Submissions and has no changes to the Department's original position."*	Noted

3.4 Response to submissions from members of the public

Submissions received from members of the public, and Hunter Water's responses are detailed in Table 3-3.

Table 3-3 Response to submissions from members of the public

Submission	Hunter Water Response
Submitter: John Mills, Rankin Park	
"I will support the project PROVIDED THAT a renewable power supply (wind and/or solar) is constructed nearby with, at least, sufficient capacity to power the plant when the plant is producing, say, 50 percent of its maximum output of desalinated water."	Hunter Water is committed to reducing energy consumption across all of its operations. To assist in achieving the aspiration of being carbon neutral by 2030, Hunter Water has developed energy efficiency initiatives across its water supply, water treatment and wastewater networks. Hunter Water will consider all available energy options at the detailed design stage, and will prepare an operational energy plan. The energy plan will examine options to reduce power consumption through the selection of technology and through operational efficiencies. The energy plan will also examine available options for reducing energy impacts such as Corporate Power Purchase Agreements, purchasing Renewable Energy Certificates, or developing on-site renewable energy options. Due to the limited land area at the site, on-site renewable developments such as solar or wind plants are unlikely to be able to provide sufficient energy to meet the Project's total requirements. On-site renewable developments may be sufficient to partially meet the Project's energy requirements. Off-site renewable energy options would be examined at the detailed design stage.

Submitter: Mike Blayney, Eleebana	
“Section 2.6.4 (Alternatives to the proposal) *The response given under Section 2.6.4.2 to Submission 13, Item 4 does not make any reference to the suggested use of renewable power generated by wind turbines (similar to Kurnell Desalination Plant) other than Hunter Water will consider purchasing renewable energy certificates, or on-site renewable options to partially offset (power) consumption.* *The power demand will increase from 3 MW (EIS Section 2.7.3) to 6.7 MW (calculated from Table 3.15) with the doubling of the desalination plant’s capacity. The case presented in the EIS Submission 13, Item 4 for increasing the (total) renewable energy used by Hunter Water to the equivalent of that required by the desalination is now paramount. This is further discussed in Section 3.5.2.9 comments below.”*	Hunter Water is committed to reducing energy consumption across all of its operations. To assist in achieving the aspiration of being carbon neutral by 2030, Hunter Water has developed energy efficiency initiatives across its water supply and water treatment networks. Hunter Water will consider all available energy options at the detailed design stage, and will prepare an operational energy plan. The energy plan will examine options to reduce power consumption through the selection of technology and through operational efficiencies. The energy plan will also examine available options for reducing energy impacts such as Corporate Power Purchase Agreements, purchasing Renewable Energy Certificates, or developing on-site renewable energy options. Due to the limited land area at the site, on-site renewable developments such as solar or wind plants are unlikely to be able to provide sufficient energy to meet the Project’s total requirements. On-site renewable developments may be sufficient to partially meet the Project’s energy requirements. Off-site renewable energy options would be examined at the detailed design stage.
“Section 3.5.2.5 *Operational phase ‘social impacts’ are limited to the comment that the Hunter Region residents would benefit from the improved water security, and apart from noise and vibration, traffic and transport, and visual amenity (covered in the EIS), that no other (social) impacts were identified.* *Notwithstanding the statement in Appendix B (Updated Project Description) Section 1.7 – that the quantum of any impact to customer prices will be determined by IPART should the project proceed, it is*	If the Project was constructed, an indicative ongoing impact to customer’s bills would be an increase of approximately $52 per year to the typical annual bill of $1,300. In years where the Project was switched on and operated for the full year, an additional $28 per year would be added to this increased annual bill.

more than likely that Hunter Water would (should) have an indicative range of the cost impacts to consumers. These impacts would be for both the 'construct and operate' stage, and the 'stand down and mothball' stage. As a significant social impact, some indication even in the most general of quantum, is warranted."	
"Section 3.5.2.9 *Greenhouse gas emissions for the 30 ML/day amended proposal have increased by 70% compared to the previous 15 ML/day proposal. This further strengthens the case for inclusion of renewable energy to completely provide the 6.7 MW (calculated from Table 3.15) required for the desalination plant's operation. This could be by either a direct connection to a renewable source, or as a new offset additional to that which <u>already exists/or is planned</u> if the desalination plant construction and operation did not proceed."*	Hunter Water is committed to reducing energy consumption across all of its operations. This includes reducing greenhouse gas impacts from energy use across the water supply and water treatment networks. Hunter Water will consider all available energy options at the detailed design stage, and will prepare an operational energy plan. The energy plan will examine options to reduce power consumption through the selection of technology and through operational efficiencies. The energy plan will also examine available options for reducing energy impacts such as Corporate Power Purchase Agreements, purchasing Renewable Energy Certificates, or developing on-site renewable energy options. Due to the limited land area at the site, on-site renewable developments such as solar or wind plants are unlikely to be able to provide sufficient energy to meet the Project's total requirements. On-site renewable developments may be sufficient to partially meet the Project's energy requirements. Off-site renewable energy options would be examined at the detailed design stage.
"Appendix F – Concept Design Drawings *Direct Ocean Intake Plan (300/15830) does not show where the 121 m length of the 55 diffuser ports are located on the original (1992) section of the existing WWTW outfall, hence it is not clear what the minimum distance is between the Intake Head Structure and the closest diffuser port."*	Appendix F of the Amendment Report contains the Project's concept designs drawings. Drawing 15830 Titled "CS0865 Belmont Drought Response Desalination Plant Concept Design Direct Ocean Intake" (Sheet 16 of 17) shows the location of the diffuser ports on the existing Belmont WWTW outfall pipeline.

	The diffusers start approximately 200m from the end of the outfall pipeline and continue to the end of the pipeline. The drawing shows the location of the proposed intake structure, and the distance between the diffusers and the proposed intake structure. The distance shown on the drawing is 1,438m.
"Appendix M – Brine Discharge Modelling Report ***Section 4.4.2 and Section 6 (Conclusions)*** *The operational risk of outfall diffuser discharge entering the sea intake structure is rated as 'low', and within acceptable (toxin) limits 90% of the time based on modelling.* *This indicates that there is some possibility of an event(s) where human health acceptable toxin limits could be exceeded through some degree of recirculation of diffuser discharge.* *There is no reference to sampling, testing or monitoring in the water treatment process (ref Appendix D – Update Project Description, Section 1.1.2). Therefore it is not clear how the risk of an outfall discharge contamination event will be managed should it be realized."*	**Brine discharge modelling** Treated effluent discharged from the Belmont WWTW would be diluted by brine from the desalination process. In dry conditions, typical of when the desalination plant would be operated, the typical proportion of treated effluent in the co-mingled discharge would be in the range of 20% - 60%. In wet periods, this could increase to between 50% and 80%. Hydrodynamic modelling was completed to determine the potential for co-mingled discharge, diluted by the receiving seawater, to reach the intake structure located over 1,400 metres away. A conservative value of 1% co-mingled discharge as a proportion of the seawater at the intake was set as the risk threshold. The modelling showed that treated effluent would contribute up to 0.035% of water at the intake structure in dry conditions. **Human health acceptable toxin limits could be exceeded** The modelling was conservative by design, as it did not consider the likely pathogen decay or die-off during transportation over the 1,400m distance separating the WWTW diffusers and the proposed intake location. The median typical concentration of enterococci in treated effluent is 938 MPN/100ml. MPN refers to the most likely number of viable bacteria in a

	sample. The highest 1% concentration of enterococci in treated effluent recorded at the site (representing worst-case conditions) is 2,048 MPN / 100ml. Modelling shows that for the highest 1% concentration discharged from the WWTW, less than 7.5 MPN / 100ml would be in the seawater at the intake location. This represents 0.3% concentration at the intake structure. The seawater is then treated via filtering, chemical processes and reverse osmosis trains for desalination to meet Australian Drinking Water Guidelines. **Sampling, testing and monitoring** Hunter Water is committed to providing our customers with high quality, continuously safe drinking water. As required under our operating licence, Hunter Water must maintain and fully implement a drinking water quality management system that is consistent with the Australian Drinking Water Guidelines (ADWG) Framework for the Management of Drinking Water Quality. If the Project proceeds to operation, Hunter Water would be required to update its drinking water quality management system to incorporate the additional drinking water supplied from the Belmont Drought Response Desalination Plant. Hunter Water will engage closely with stakeholders, including NSW Health, to ensure the drinking water quality management system is appropriately updated to address all elements of the ADWG as they related to the Project. This includes, but is not limited to using a risk-based approach to managing water quality from catchment to customer, ensuring timely monitoring and corrective actions are undertaken at Critical Control Points, undertake regular water quality monitoring and ensuring effective incident and emergency response is in place. Refer to the Drinking Water Quality Policy for further information, which is available at Hunter Water's website.

3.5 Response to organisation submissions

The submissions that was received from an organisation, and Hunter Water's responses are detailed in Table 3-4.

Table 3-4 Response to submissions from organisations

Submission	Hunter Water Response
Submitter: Fluence	
"Dear Sirs, *We appreciate the opportunity to present our technical proposal for sea water desalination plant for up to 15,000m^3/day product water, based on ten (10) seawater desalination NIROBOX SW-MEGA units, or 30,000 m^3/day product water based on (20) seawater desalination NIROBOX SW-MEGA and optional post-treatment system composed of remineralization unit and chlorination unit.* *NIROBOX SW-MEGA is a complete seawater desalination plant, mounted in a 40-foot, temperature-controlled container, allowing quick installation and east operation, offering a solution for seawater desalination with low consumption of energy and chemicals. Below, please a technical description of the equipment and proposed commercial conditions."* *Attachment A – Company overview, NiroBox SW overview, System overview.* *Attachment B – NiroBox SW Product Sheet and Specifications.*	Noted. The preferred technology to be used for the Project will be selected as part of the detailed design stage.

4 PROJECT JUSTIFICATION

4.1 Benefits of the Project

The Hunter Region is vulnerable to drought because water storage levels can fall quickly. Modelling of an extreme drought indicates the Hunter Region's total water storage level could drop very quickly as follows:

- From 65 per cent to 35 per cent in approximately 14 months
- From 35 per cent to 15 per cent in approximately 10 months

This modelling shows that in an extreme drought water storages could drop from 65 per cent to 15 per cent in only 24 months due in part to high natural loses from evaporation. In the event of an extreme drought the Project would provide a water source that is not dependent on rainfall, and would assist to slow the depletion of existing water storages.

Hunter Water commenced design and environmental assessments for the Project to ensure a desalination plant would be operational in the unlikely event that overall storages reach 15%. Since commencing this process Hunter Water has begun a major review of the 2014 LHWP. This review has identified, in the event of a rare and unprecedented drought (i.e. resulting in storages approaching empty), there would be a shortfall between the system's existing supply capacity and minimum customer demands in the region; even with the Project as proposed in the EIS.

While the chance of such an extreme drought is extremely low, the consequences to the region are severe. To reduce the risk of the potential shortfall between supply capacity and restricted demand, Hunter Water proposes to increase the production capacity of the water treatment process plant to 30 ML/day.

The key benefits of the Project include:

- Improving the resilience of the Lower Hunter to drought, by reducing the probability of running out of water
- Avoiding financial and non-financial costs for households and businesses related to more severe water restrictions and/or prolonging existing water storages
- Minimal disruption to business, households and the environment.

4.2 Consequences of not proceeding

If the Project does not proceed and an extreme drought occurs, the Lower Hunter Region is at risk of running out of water. The consequences of the region running out of water would be severe and include:

- Health impacts from reduced water for drinking and sanitation
- Potential impacts to the continued operation of industries due to lack of access to water, and economic impacts due to reduced productivity
- Increased costs of importing water from other regions.

In event of an extreme drought and in the absence of the Project, Hunter Water would be forced to put in place severe and drastic limits on water use as water storages fall below 30 per cent.

4.3 Confirmation of preferred project

The preferred Project is a desalination plant on Hunter Water land at the Belmont site, with a production capacity of 30 ML/day. Seawater would be extracted via a direct ocean intake pipeline, and brine would be disposed via the existing Belmont WWTW ocean outfall. Hunter Water is seeking a 10 year planning approval term for the Project.

5 CONCLUSION

The Lower Hunter Region's water storages are vulnerable to rapid depletion in drought. The Project is needed as an insurance policy for extreme drought. The Project would provide a rainfall-independent source of water, and would slow the depletion of existing water storages in the event of an extreme drought. While the chance of such an extreme drought is low, the consequences to the region would be severe.

Obtaining planning approval for the Project is required to ensure the Project can be deployed quickly in the event of extreme drought. Hunter Water is seeking a 10 year Project approval. This would allow further Project stages, including detailed design, to be progressed at the appropriate time based on water storage levels.

Since the Environmental Impact Statement (EIS) was completed and lodged with DPIE in October 2019, the Project has been modified and refined to better respond to site conditions and longer term operational requirements. The proposed production capacity has been increased from 15 ML/day to 30 ML/day. The increased production capacity represents a better value for money solution to drought response and longer term water planning.

Following completion of the EIS further design development and liaison with Hunter Water's construction partners identified reliability and construction risks associated with the proposed horizontal sub-surface intake system. An assessment of the horizontal sub-surface intake system was undertaken against alternative intake options including a direct ocean intake, vertical sub-surface wells and inclined sub-surface wells. Options were evaluated against relevant criteria including environmental impact, constructability, maintenance and durability, water quality, program and cost. This assessment found that a direct ocean intake would perform considerably better than a sub-surface option. Further, direct ocean intake systems have been used at all of the seawater desalination plants constructed in Australia in the last two decades proving their suitability

Hunter Water completed additional and updated environmental investigations to assess potential impacts from the increased plant capacity and the amended seawater intake design. While no significant environmental or social impacts were identified, construction and operation of the Project has the potential to produce environmental impacts. These impacts would be mitigated or managed through the adoption of appropriate and targeted environmental measures. Mitigation and management measures would be developed and detailed in the Project's Environmental Management Plans.

The findings of the environmental investigations, together with the proposed mitigation and management measures, were documented in the Belmont Desalination EIS Amendment Report and Response to Submissions Report (Amendment Report). The Amendment Report was lodged with the NSW Department of Planning, Industry and Environment (DPIE) in June 2020 and placed on public exhibition on the DPIE Major Projects website.

Throughout the preparation of the Amendment Report Hunter Water continued to engage with stakeholders. Stakeholders were contacted in order to share Project information, gather insights and understand potential issues of concern. Engagement has also been important in identifying potentially new stakeholders that may not have had an interest in, or be affected by, the previous design from the EIS Project.

Hunter Water requested that DPIE extend the exhibition period for the Amendment Report from the statutory two weeks to four weeks. This request was made to provide stakeholders with the opportunity to adequately review the amended design and revised environmental assessments. This Supplementary Response to Submissions Report has considered the issues raised in the submissions received during the exhibition of the Amendment Report.

The EIS and Amendment Report have documented the potential environmental impacts of the Project, considering both negative and positive impacts. The concept design has been informed by the assessment of potential environmental impacts, and by stakeholder engagement. This has allowed potential environmental and social impacts to be minimised, while maintaining the Project's feasibility. The EIS and Amendment Report have demonstrated that the Project is a robust response to a recognised need and provides a number of benefits. The Project's benefits would outweigh negative impacts.

APPENDIX A SUBMISSIONS FROM PUBLIC AUTHORITIES

Mr Chris Gilmore
Project Manager – Water Resilience
Hunter Water Corporation
36 Honeysuckle Drive
Newcastle NSW 2300

19/10/2020

Dear Mr Gilmore

Belmont Drought Response Desalination Plant (SSI-8896)
Preferred Infrastructure Report — Response to Submissions

The exhibition of the development application including the Preferred Infrastructure Report and Response to Submissions ended on 7 October 2020. All submissions received by the Department during the exhibition of the proposal are available on the Department's website at www.planningportal.nsw.gov.au/major-projects/projects.

The Department requires that you provide a response to the issues raised in those submissions. You are also requested to respond to the issues presented within Attachment 1 of this letter. Please provide a response to the issues raised in these submissions within two months / by Friday 18 December 2020.

If you have any questions, please contact Rebecca Sommer, who can be contacted on 9274 6184 or at Rebecca.Sommer@planning.nsw.gov.au.

Yours sincerely

Karen Harragon
Director, Social And Infrastructure Assessments
Social & Infrastructure Assessments

as delegate for the Planning Secretary

Attached: Attachment 1

Attachment 1: Key Issues

The Department requests additional information and/or clarification on the following:

Consistency and relevance across documentation

There are inconsistences across the supplementary technical reports provided to support the preferred project (i.e. some reports provide a comprehensive list of mitigation measures that apply to the whole preferred project, some provide the measures that apply to the amended sections only, some provide a full revised report and some provide an addendum report).

The Department requests that the reports are made consistent or that a comprehensive summary document be provided that clearly stipulates all sections of the EIS and associated appendices that remain relevant and applicable to the preferred project as a whole.

Buildings and hardstand

A summary of the areas of hardstand areas, buildings (height, area, materials) and roof areas of the desalination plant are to be provided. This should also include detail of the management of surface water/stormwater flows and flows associated with any overtopping during king tide events and 1 in 100 rainfall events.

Mitigation Measures

The Department requests a table of detailed mitigation measures that will be implemented as part of the preferred project. It is not considered sufficient to refer to the measures provided within technical reports. Mitigation measures must be clearly consolidated and committed to by the Applicant.

Additional Information

The Department also requests the following information:

- Detail of the decommissioning of the evaporation ponds, including year and detail of any approvals obtained.
- Consideration of stormwater flows during construction and operation.
- Details of car parking to be provided during construction and operation.
- Confirmation of the depth of the sea water shaft - there are conflicting depths in documentation provided.
- Detail of the ‘groundwater treatment system’ that will be utilised during shaft installation.
- Detail of the ‘liner type storage tanks’ that would be established during construction (i.e. number, size, location).

Confirmation that the entirety of the brine pipeline would be contained within Hunter Water owned land. This should consider the submission/s received from Crown Lands.

14 October 2020

Hunter Water Corporation
PO BOx 5171
HRMC NSW 2310
Attn: Chris Gilmore

Dear Chris

Subject: **LMCC Response to Belmont Drought Response Desalination Plant – SSI-8896**

Thank you for notifying Council of the latest proposal for the Belmont Drought Response Desalination Plant. Apologies on this delayed response from Lake Macquarie City Council Staff.

Council has earlier responded to this project, in late 2019 (Belmont Desalination Plant SSI - 8896 -Council Ref: MISC/279/2017/B) and raised a number of issues at that time.

In response to this latest version Lake Macquarie City Council officers would like to note or seek the following to be addressed prior to, or as part of any determination.

Environmental Planning

The modification to avoid ground water drawdown on the Belmont Lagoon and surrounding wetlands is supported.

Issues associated any bycatch from drawing in ocean water should be addressed.

Erosion and Sediment Control

The Belmont Drought Response Desalination Plant Submissions and Amendment Report dated August 2020 has addressed earlier concerns. The proposed erosion and sediment control actions are in accordance with our DCP.

Our Ref: MISC?279/2017/C   Your Ref: HW2017-1122/4/30.001

Visual Amenity

The site is adjacent to a number of important recreational and tourist places and facilities for Lake Macquarie City. The Visual Impact Assessment (VIA) findings are supported, however the mitigation measures for the site are no,t as they do not include any revegetation that addresses the identified visual impacts. Addressing the identified visual impacts from Nine Mile Beach and the western track brings multiple benefits to the site and broader environment that reflects positively on Lake Macquarie City. The VIA discusses the future Hunter Water plans for dune restoration and revegetation for the adjoining WWTP site, however this does not include the current site.

The following conditions are recommended:

> A landscape restoration plan is to be prepared by a qualified landscape architect that includes concept and construction level documentation for revegetation of the dunal system (eastern boundary), northern and southern perimeter, and identify planting opportunities along the western boundary. The landscape documentation is to be informed by the visual impact assessment and biodiversity reports for the project and maximise opportunities for visual fragmentation and/or screening of the site from the east and west. The landscape works are to be undertaken concurrently with the construction of the facility and maintained in perpetuity.
>
> The colours of the vertical elements on the site are to be visually recessive and include the darker greys and browns.

Environmental Amenity

Council's previous submission comments are noted:

Noise

A Noise and Vibration Assessment Report has been prepared by GHD, dated November 2019.

The report has assessed the potential noise and vibration from construction and operation of the proposed project in accordance with the requirements and guidelines of the NSW EPA, and provided recommendations to mitigate impacts on the nearest sensitive receivers.

Contamination

A Contamination Assessment Report has been prepared by GHD, dated November 2019.

The assessment reported contamination in the soil and on the soil surface and determined that, at this stage, no significant human health or environmental risks to construction workers or future site users were identified, however disturbed soils are required to be managed to protect the environment. The report recommends a Contaminated Soil Management Plan (CSMP) be developed as part of the Construction Environmental Management Plan. The CSMP will also deal with unexploded ordnances.

Flooding

Minimum floor level for the development should be 2.36m AHD.

All unsealed electrical installations associated with the proposed development i.e. pumps, switches, power points, motors, etc, should comply with the protection against electrical shock provisions for damp situations" outlined in Australian Standard AS 3000 "Australian/New Zealand Wiring Rules".

Heritage

The application includes an Aboriginal Cultural Heritage Assessment in accordance with OEH (BCD) requirements, which includes appropriate recommendations.

Lake and Foreshore Impacts

Section 3.4.1 of the Belmont Drought Response Desalination Plant Submissions and Amendment Report addresses clauses in the SEPP (Coastal Management) 2018, but does not appear to consider clause 15 of the SEPP.

Council also seeks clarification on the detail of the intake structure pipeline. In particular, we wish to ensure that this pipeline is installed at an adequate depth below the sea-bed to ensure that it does not result in altered sand movements in either the near-shore or off-shore area. Council studies identified a high amount of submerged sand movement along 9-Mile beach and we wish to ensure that the pipeline construction caters for future changes in the near & off-shore profile and does not interfere with sand movement patterns. We also wish to confirm the amount of sand that will be removed by the direct drilling process, and the proposed disposal location for this material.

The Belmont Drought Response Desalination Plant Submissions and Amendment Report (section 3.5.1) indicates that no further assessment is required regarding marine biodiversity impacts. Council remain concerned over the potential impacts on marine biodiversity, particularly larval impacts related to the operation of the intake structure. We suggest that an ongoing monitoring program is warranted to assess these impacts should the project be approved.

Council Assets – Roads

Ocean Park Road Belmont South has failed due to heavy vehicles gaining access to the nearby treatment works and beach access. Asset Management will require the road from Green Street to the main access gate to Hunter Water land, to be reconstructed.

Council has undertaken a pavement investigation of the road and it was identified, that asbestos was observed. This material imposes a level of complexity into the construction, which means the road will require a granular overlay 300-400mm thick and sealed to meet expect vehicle usage.

As part of these works stormwater will need to be catered for, that will require additional drainage to take a water build up from the northern side of the road and discharged into the sand dunes. Due to potential aboriginal artefacts being present, an impact study will be required for where the water discharge is likely to occur.

Further consultation with Council's Sustainability section will be required regarding the formalisation of beach access in this immediate area.

Engineering

Stormwater Management

A suitable Stormwater Management Plan by GHD P/L Drg. 2219573 incorporating water harvesting, water quality facilities and site discharge index requirements in accordance with the Lake Macquarie DCP 2014 has been provided.

Natural Water Systems

The proposed development is located (within the vicinity of/adjacent to) Belmont Lagoon and the Pacific Ocean, which are considered natural water bodies. The stormwater management plan prepared by GHD P/L 2219573 has incorporated facilities which will eliminate or limit any likely adverse effects on the water body and/or ecosystem adjacent or downstream receiving waters. It is therefore considered that the development as proposed will have no significant adverse impacts.

Design of Parking and Service Areas

Parking

The internal driveway and car parking area (including turning movements) for the development appear adequate for the development and comply with the DCP 2014 requirements and AS 2890.1 Parking Facilities – Off Street Parking & AS 2890.6 Parking Facilities – Off-street parking for people with disabilities.

Servicing

The proposed development has included adequate facilities for service vehicles.

Construction Management Plan

A Construction Management Plan should be required and fencing provided along the western side of the site providing a barrier to the neighbouring wetlands and Belmont Lagoon.

The Construction Management Pan should specifically address avoiding impacts on the native vegetation to the west of Ocean Park Road. This would include avoiding impacts that might arise from use of the road to access the site or upgrading the road.

Should you require further information or clarification, please contact me on adleese@lakemac.nsw.gov.au or 4921 0201.

Yours faithfully,

Andrew Leese
A/Principal Development Planner
DA&C - Development

OUT20/11000

Rebecca Sommer
Planning & Assessment
NSW Department of Planning, Industry and Environment

rebecca.sommer@planning.nsw.gov.au

Dear Ms Sommer

Belmont Drought Response Desalination Plant (SSI 8896)

RtS and Amendment Report

I refer to your email of 8 September 2020 to the Department of Planning, Industry and Environment (DPIE) Water and the Natural Resources Access Regulator (NRAR) about the above matter.

The following recommendations are provided by DPIE Water and NRAR.

Prior to approval

Groundwater Flow Management

- Inform DPIE-Water of the maximum volume of groundwater inflow predicted for the final design construction method selected.
- Detail the method of estimation of the maximum volume of groundwater inflow predicted for the final design construction method selected.
- Should the proponent commit to re-injection of the fresh groundwater back into the coastal sand aquifer further detail outlining this approach is to be submitted to DPIE-Water prior to commencement of these activities.
- Outline how a Water Access Licence (WAL) will be acquired to account for the maximum volume of groundwater inflow predicted for the final design construction method selected.

Note: these four recommendations may be submitted as parts of a dewatering management plan for the final design construction method selected.

Acid Sulphate Soil Management Plan

- Prepare and submit an acid sulphate soil management plan to DPIE Water.

Refer to **Attachment A** for more detailed advice on the above recommendations.

Post Approval

- Any WAL required must be obtained from NRAR to account for groundwater inflows and/or take from the Groundwater Source prior to any take of water occurring.

Yours sincerely

Simon Francis
Senior Project Officer
DPIE Water – Strategic Relations
9 October 2020

ATTACHMENT A

Belmont Drought Response Desalination Plant (SSI 8896)
RtS and Amendment Report

The proponent has redesigned the proposed sub-surface seawater intake system for the project in the EIS to a direct ocean intake. Which will include an onshore sea water pumping station, intake pipeline and offshore intake structure. The potential impacts of a sealed direct ocean intake system differ considerably from that of the original EIS proposal. Largely reducing the impact upon the Hawkesbury to Hunter Coastal Sands Groundwater Source and negating the need for further extensive groundwater modelling and independent peer review.

Department of Planning, Industry and Environment – Water (DPIE-Water) understand the proponent is considering two alternative options for the direct ocean intake system:

1. A 20 m deep, of approximate 9 m to 11 m diameter, concrete lined excavation (‘wet well’); connected via a horizontal directional drilled large diameter bore hole developed as the 1000 m long pipeline (Figure 1) to an intake valve structure on the seafloor at approximately 23m below mean sea level.
2. An approximately 20 m deep x 10 m to 10 m width and length, concrete lined excavation from which a large diameter pipe jacking micro-tunnelling method of construction of the 1000 m long pipeline will occur. Connecting to the intake valve structure at the seafloor level.

Without sheet piling both of the construction method options will involve take of groundwater resulting from dewatering of the initial excavation. For a proposed construction period of 180 days, the proponent estimates that a total of 911 ML of groundwater will be extracted by construction method 1 above. Whilst, for the same construction period, a total of 3,047 ML of groundwater will be extracted by construction method 2.

The proponent acknowledges that “All construction methods will require a Water Access Licence to cover the take of groundwater from excavations.” Initially the excavation, in both newly proposed construction methods, will be metal sheet pile lined to reduce groundwater inflow and provide a suitable safe working environment before being concrete lined.

The proponent has proposed that “Fresh groundwater extracted from the excavations during construction may be disposed by infiltration back to groundwater at a distance from the construction area.” DPIE-Water notes the brief outline of the re-injection proposed in the report. Further detail of the postulated re-injection of the fresh groundwater back into the coastal sand aquifer would be required should the proponent commit to this activity.

The proponent makes the points that the fresh groundwater within the unconfined sand aquifer lenses to the east (coast) and extends to a depth of approximately 10 m at the proposed excavation sites. As determined by electrical conductivity profiling studies on site. Groundwater quality monitoring will need to be a key activity to reduce the risk of cross contamination of the fresh groundwater aquifer. The proponent proposes that saline groundwater extracted below 10 m depth will be discharged, after treatment, to the ocean via the existing wastewater ocean outfall.

Once construction is completed dewatering activities will cease from the onshore sea water pumping station, intake pipeline and offshore intake structure. As a result of the redesigned direct intake system negligible potential impacts to groundwater interference and groundwater dependent ecosystems from the operation of the seawater desalination plant are expected.

END ATTACHMENT A

Hunter New England Local Health District
Hunter New England Population Health
Direct Contact Details
Phone: (02) 4924 6477 Fax: (02) 4924 6490
Email: nichole.mason@health.nsw.gov.au

NSW GOVERNMENT
Health
Hunter New England
Local Health District

02 October 2020

Ms Rebecca Sommer
Senior Planning Officer
NSW Planning & Environment
GPO Box 39
SYDNEY NSW 2001

Email:Rebecca.sommer@planning.nsw.gov.au

Dear Ms Sommer

Belmont Drought Response Desalination Plant (SSI-8896) – Response to Submissions and Preferred Infrastructure Report

I refer to the Response to Submissions (RTS) and the Preferred Infrastructure Report (PIR) for the Belmont Drought Response Desalination Plant (SSI-8896) sent to Hunter New England Population Health (HNEPH) for comment.

The RTS has been reviewed in conjunction with the PIR with particular attention being paid to our previous concerns with water quality, noise and community consultation. The review of the RTS/PIR indicates that the amended proposal is likely to have minimal impact on public health.

It is noted that the water would be treated to meet drinking water requirements prior to being delivered to the water supply network. It is paramount that NSW Health and NSW Department of Planning, Industry and Environment (DPIE) water are consulted throughout all stages to ensure safe drinking water is delivered to the public.

Should you require any additional information, please contact Ms Nichole Mason, Environmental Health Officer on 4924 6477.

Yours sincerely

Professor David Durrheim
Director - Health Protection
Hunter New England Population Health

Transport for NSW

CR2020/004458
SF2017/266551
KK

21 September 2020

Department of Planning, Industry & Environment
Industry Assessments
GPO Box 39
SYDNEY NSW 2001

Attention: Rebecca Sommer

SSI-8896– BELMONT DORUGT RESPONSE DESALINATION PLANT, SUBMISSIONS AND AMENDMENTS REPORT, BELMONT NORTH.

Transport for NSW (TfNSW) advises that legislation to dissolve Roads and Maritime Services and transfer its assets, rights and liabilities to TfNSW came into effect on 1 December 2019. It is intended that the new structure will enable TfNSW to deliver more integrated transport services across modes and better outcomes to customers and communities across NSW.

For convenience, correspondence, advice or submissions made to or by Roads and Maritime Services prior to its dissolution, are referred to in this letter as having been made to or by ‘TfNSW’.

On 08 September 2020 TfNSW accepted the referral by the Department of Planning, Industry and Environment (DPIE) Planning Portal regarding the abovementioned Submissions and Amendments Report (the Report). DPIE referred the Report to TfNSW for comment. This letter is a submission in response to that referral.

It is noted Hunter Water Corporation previously prepared an environmental impact statement (EIS) to assess the potential impacts of the Project, and the EIS was exhibited by DPIE for a period of 28 days, from 21 November to 19 December 2019. TfNSW reviewed the EIS and provided its advice in a letter dated 30 January 2020.

The Submissions and Amendment Report considers the issues raised in the community, agency and stakeholder submissions received during the public exhibition of the EIS, and Hunter Water’s response to these issues. It also provides description and assessment of the proposed changes made to the Project as described in the EIS.

It is understood that the proposal be for Hunter Water Corporation to construct and operate a drought response desalination plant (the ‘Project’), adjacent to the Belmont Wastewater Treatment Works in Belmont South.

The Project described in the EIS included the construction and operation of a desalination plant, designed to produce up to 15 megalitres per day (ML/d) of potable water. The desalination plant proposed in amended report would have a capacity of up to 30 ML/day of potable water.

The Report state, for amended proposal, "*a total of 752 trucks are expected to access the construction site across an eight month timeframe for construction of the intake as a worst case scenario. This results in an average of approximately 94 trucks accessing the Project area per month (a decrease of 16 trucks per month from that described in the EIS1), being approximately four trucks per day (a decrease of one truck per day from that described in the EIS).*" The report further states in addition to above *"there will be 30 inbound and 30 outbound worker movements (light vehicles) per day (an increase of 20 inbound and 20 outbound light vehicle movements from that described in the EIS)".*

Traffic Assessment states that there is expected to be very little operational or maintenance input for the desalination plant for the amended Project.

<u>TfNSW response & requirements</u>

TfNSW's primary interests are in the road network, traffic and broader transport issues. In particular, the efficiency and safety of the classified road network, the security of property assets and the integration of land use and transport.

The Pacific Highway (A43) is a classified State road, and Beach Street and ocean Park Road are local roads. Council is the roads authority for both roads and all other public roads in the area, in accordance with Section 7 of the *Roads Act 1993*.

TfNSW have reviewed the Belmont Drought Response Desalination Plant Submissions and Amendment Report prepared by GHD and dated August 2010, and its appendices, including Appendix P Traffic Assessment dated 29 June 2020, and raises no objection to or requirements for the proposed development as it is considered there will be no significant impact on the nearby classified (State) road network.

On determination of this matter, please forward a copy to TfNSW for record and / or action purposes. Should you require further information please contact Kumar Kuruppu, Development Assessment Officer, on 0429 037 333 or by emailing development.hunter@rms.nsw.gov.au.

Yours sincerely

Peter Marler
Manager Land Use Assessment
Hunter Region

CR2020/004458
SF2017/266551
KK

21 September 2020

Department of Planning, Industry & Environment
Industry Assessments
GPO Box 39
SYDNEY NSW 2001

Attention: Rebecca Sommer

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On determination of this matter, please forward a copy to TfNSW for record and / or action purposes. Should you require further information please contact Kumar Kuruppu, Development Assessment Officer, on 0429 037 333 or by emailing development.hunter@rms.nsw.gov.au.

Yours sincerely

Peter Marler
Manager Land Use Assessment
Hunter Region

Our ref: DOC20/730708

Ms. Rebecca Sommer
Principal Planning Officer
Social Other Infrastructure Assessments
Department of Planning, Industry and Environment

By email: rebecca.sommer@planning.nsw.gov.au

Dear Rebecca

Advice regarding Amendment – State Significant Infrastructure – Belmont Drought Response Desalination Plant – Lake Macquarie LGA (SSI – 8896)

Thank you for your email dated 7 September 2020, inviting comment from Heritage NSW (HNSW) on the *Addendum to Aboriginal Cultural Heritage Assessment Report – Project Area Amendment*, with respect to the Belmont Drought Response Desalination Plant, prepared by RPS and dated 29 May 2020.

The Biodiversity and Conservation Division (BCD) of the Department of Planning, Industry and Environment (DPIE) previously provided comments on this proposal on 13 December 2019 (DOC19/1018918-8), at which time it was advised that the supplied Environmental Impact Statement (EIS) and Aboriginal Cultural Heritage Assessment Report (ACHAR) did not adequately address the SEARs issued for the project by providing adequate management measures for proposed impacts to Aboriginal cultural heritage.

As the office now responsible for the regulation of Aboriginal cultural heritage, Heritage NSW (HNSW) of the Department of Premier and Cabinet (DPC) have reviewed the supplied *Addendum to the Aboriginal Cultural Heritage Assessment Report* (RPS 2020) and have determined that the document sufficiently addresses the issues raised in the previous comments.

However, it should be noted that Section 8: Management and Mitigation, (page 12 of the report) which specifies an AHIP (Aboriginal Heritage Impact Permit) may be required prior to impacting a site, should be revised and corrected. To clarify, an AHIP is a statutory instrument issued under Part 6 of the *National Parks and Wildlife Act 1976* (NP&W Act) and does not apply to the current project, which is being assessed under separate legislation, Part 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), Major Project, State Significant Infrastructure (SSI).

If you have any questions regarding the above advice, please contact Rebecca Yit, Archaeologist at Heritage NSW, on 4927 3244 or rebecca.yit@environment.nsw.gov.au

Yours sincerely

Dr Samantha Higgs
Senior Team Leader
Aboriginal Cultural Heritage Regulation - North
Heritage NSW
Date: 18 September 2020

Our ref: DOC20/73019

Rebecca Sommer
Department of Planning, Industry and Environment
320 Pitt Street
SYDNEY NSW 2000

By email: Rebecca.Sommer@planning.nsw.gov.au

Dear Ms Sommer

Re: Notice of Exhibition of application for Belmont Drought Response Desalination Plant (SSI-8896)

Thank you for your referral dated 7 September 2020 inviting comments from the Heritage Council of NSW on the above State Significant Infrastructure proposal.

The subject site is not listed on the State Heritage Register (SHR), nor is it in the immediate vicinity of any SHR items. Further, the site does not contain any known historical archaeological deposits. Therefore, no further heritage comments are required. The Department does not need to refer subsequent stages of this proposal to the Heritage Council of NSW.

If you have any questions regarding the above advice, please contact Gary Hinder, A/Senior Heritage Assessment Officer, at Gary.Hinder@environment.nsw.gov.au or on 9873 8547.

Yours sincerely

Anna London
A/Senior Team Leader Customer Strategies
Heritage NSW
Department of Premier and Cabinet
As Delegate of the Heritage Council of NSW
10 September 2020

DOC20/733238-9

Department of Planning, Industry and Environment
Returned via Email

Email: Nathan.stringer@planning.nsw.gov.au

12 November 2020

Dear Mr Stringer

Planning Referral – Response to Submissions
Belmont Desalination Plant (SSI-8896)

I refer to Department of Planning, Industry and Environment's (DPIE) email to the Environment Protection Authority (EPA) received 7 September 2020, providing opportunity to comment on a Preferred Infrastructure Report (PIR) and Response to Submission (RtS) for the Belmont Drought Response Desalination Plant proposal.

Reference is also made to the EPA's letter of 19 December 2019 to DPIE providing recommended conditions for the proposal. The EPA has reviewed the PIR and RtS and makes no changes to the recommended conditions provided in Attachment A of its letter of 19 December 2019.

If you have any questions about this matter, please contact Jenny Lange on 02 4908 6891 or by email to hunter.region@epa.nsw.gov.au

Yours sincerely

MARK HARTWELL
Unit Head
Regulatory Operations Regional North

Our ref: DOC20/732497-21
Your ref: SSI-8896

Ms Rebecca Sommer

Principal Planning Officer
Social Other Infra Assessments
Department of Planning, Industry and Environment
Rebecca.Sommer@planning.nsw.gov.au

Dear Ms Sommer

Response to Submissions Report – Belmont Drought Response Desalination Plant (SSI-8896)

I refer to your email dated 7 September 2020 in which Social Other Infra Assessments invited Biodiversity and Conservation Division (BCD) of the Department of Planning, Industry and Environment (the Department) for comment on the Response to Submissions Report for the proposed Belmont Drought Response Desalination Plant project (SSI-8896), located in Belmont South; within the Lake Macquarie City Council area.

BCD has reviewed the '*Belmont Drought Response Desalination Plant Submissions and Amendment Report*' (prepared by GHD for Hunter Water Corporation, and dated August 2020), including relevant appendices, annexures and attachments in relation to impacts on biodiversity and flooding.

BCD's recommendations are provided in **Attachment A** and detailed comments are provided in **Attachment B**. If you require any further information regarding this matter, please contact Steve Lewer, Senior Regional Biodiversity Conservation Officer, on 4927 3158 or via email at rog.hcc@environment.nsw.gov.au

Yours sincerely

21 September 2020

STEVEN COX
Senior Team Leader Planning
Hunter Central Coast Branch
Biodiversity and Conservation Division

Enclosure: Attachments A and B

Attachment A

BCD’s recommendations

Belmont Drought Response Desalination Plant (SSI-8896)

Biodiversity

1. BCD is satisfied that the RTS report has satisfactorily addressed our previous biodiversity comment (dated 13 December 2019) and no further biodiversity assessment is required.

Coastal management

2. BCD is satisfied that the RTS report has satisfactorily address previous coastal comments and no further coastal assessment is required.

Attachment B

BCD's detailed comments

Belmont Drought Response Desalination Plant (SSI-8896)

Biodiversity

1. BCD is satisfied with the biodiversity assessment

BCD's prior review of the Environmental Impact Statement for the project contained the following recommendation (as per correspondence dated 13 December 2019 (DOC19/1017918-8)):

- BCD recommends that the groundwater monitoring program includes monitoring of vegetation condition within the area of groundwater drawdown and that the trigger, action, response plan establishes triggers and actions for any vegetation changes associated with groundwater impacts.

Recommendation 1

BCD is satisfied that the RTS report has satisfactorily addressed our previous biodiversity comment (dated 13 December 2019) and no further biodiversity assessment is required.

Coastal Management

2. BCD is satisfied with the coastal assessment

BCD is satisfied that the proponent has adequately addressed previous concerns (dated 13 December 2019).

Recommendation 2

BCD is satisfied that the RTS report has satisfactorily address previous coastal comments and no further coastal assessment is required.

Submission for: Belmont Drought Response Desalination Plant

Comments

Department of Planning, Industry and Environment - Crown Lands

Newcastle, New South Wales

Message

Hi

Crown Lands has the following comments for this proposal:-

The existing ocean outfall pipe occupies Crown land between the mean high water mark and a position approximately 1.5 km offshore. The PEA does not contain information relating to an existing authorisation to occupy this Crown land under the Crown Land Management Act 2016, or a legislative exemption, for the outfall pipe. The Department has no record of an easement or other approval for the ocean outfall pipe.

It is noted that Hunter Water has requested the closure and purchase of the affected Crown road.

Submission for: Belmont Drought Response Desalination Plant

Comments

DPI Fisheries

Taylors Beachs, New South Wales

Message

DPI Fisheries is responsible for ensuring that fish stocks are conserved and that there is no net loss of key fish habitats upon which they depend. To achieve this, DPI Fisheries ensures that developments comply with the requirements of the Fisheries Management Act 1994 (FM Act) (namely the aquatic habitat protection and threatened species conservation provisions in Parts 7 and 7A of the Act, respectively), and the associated Policy and Guidelines for Fish Habitat Conservation and Management (2013). DPI Fisheries is also responsible for ensuring the sustainable management of commercial, recreational and Aboriginal cultural fishing, aquaculture, Marine Parks and Aquatic Reserves within NSW.

The Department has reviewed the Response to Submissions and has no changes to the Departments original position.

APPENDIX B SUBMISSIONS FROM MEMBERS OF THE PUBLIC

John MILLS Supports

RANKIN PARK, New South Wales

Message

I will support the project PROVIDED THAT a renewable power supply (wind and/or solar) is constructed nearby with, at least, sufficient capacity to power the plant when the plant is producing, say, 50 percent of its maximum output of desalinated water.

Belmont Drought Response Desalination Plant

Comments in Response to Exhibition

Submissions and Amendment Report

Section 2.6.4 (Alternatives to the proposal)

The response given under Section 2.6.4.2 to Submission 13, Item 4 does not make any reference to the suggested use of renewable power generated by wind turbines (similar to the Kurnell Desalination Plant) other than Hunter Water *will consider* purchasing renewable energy certificates, or on-site renewable options to *partially* offset (power) consumption

The power demand will increase from 3 MW (EIS Section 2.7.3) to 6.7 MW (calculated from Table 3.15) with the doubling of the desalination plant's capacity. The case presented in EIS Submission 13, Item 4 for increasing the (total) renewable energy used by Hunter Water to the equivalent of that required by the desalination is now paramount. This is further discussed in Section 3.5.2.9 comments below.

Section 3.5.2.5

Operational phase "social" impacts are limited to the comment that the Hunter Region residents would benefit from the improved water security, and apart from noise and vibration, traffic and transport, and visual amenity (covered in the EIS), that no other (social) impacts were identified.

Notwithstanding the statement in Appendix B (Updated Project Description) Section 1.7 – that the quantum of any impact to customer prices will be determined by IPART should the project proceed, it is more than likely that Hunter Water would (should) have an indicative range of the cost impacts to consumers. These impacts would be for both the "construct and operate" stage, and the "stand down and mothball" stage. As a significant social impact, some indication even in the most general of quantum, is warranted.

Section 3.5.2.9

Greenhouse gas emissions for the 30 Ml/day amended proposal have increased by 70% compared to the previous 15 ML/day proposal. This further strengthens the case for inclusion of renewable energy to completely provide the 6.7 MW (calculated from Table 3.15) required for the desalination plant's operation. This could be by either a direct connection to a renewable source, or as a new offset additional to that which already exists/or is planned if the desalination plant construction and operation did not proceed.

Appendix F – Concept Design Drawings

Direct Ocean Intake Plan (300/15830) does not show where the 121 metre length of the 55 diffuser ports are located on the original (1992) section of the existing WWTW outfall, hence it is not clear what the minimum distance is between the Intake Head Structure and the closest diffuser port.

Appendix M – Brine Discharge Modelling Report

Section 4.4.2 and Section 6 (Conclusions)

The operational risk of outfall diffuser discharge entering the sea intake structure is rated as “low”, and within acceptable (toxin) limits 90% of the time based on the modelling.

This indicates that there is some possibility of an event(s) where human health acceptable toxin limits could be exceeded through some degree of recirculation of diffuser discharge.

There is no reference to sampling, testing or monitoring in the water treatment process (ref Appendix D – Updated Project Description, Section 1.1.2). Therefore it is not clear how the risk of an outfall discharge contamination event will be managed should it be realized.

Mike Blayney

6 October, 2020

APPENDIX C SUBMISSIONS FROM ORGANISATIONS

EXHIBITION OF STATE SIGNIFICANT INFRASTRUCTURE APPLICATION
Preferred Infrastructure Report and Response to Submissions
BELMONT DROUGHT RESPONSE DESALINATION PLANT

Application	No SSI-8896
Location	Belmont Wastewater Treatment Plant, Off Ocean Park Road, Belmont
Applicant	Hunter Water Corporation
Council Area	Lake Macquarie
Consent Authority	Minister for Planning and Public Spaces

Description of proposal
Construction and operation of a temporary desalination plant including: seawater intake nfrastructure (subsurface beach wells); desalination units (15 ML/d); brine discharge via existing ocean outfall; electricity/water supply; ancillary works.

Description of revised proposal
Revised application for the construction and operation of a drought response desalination plant at Belmont, including:

- Seawater intake infrastructure via direct ocean intake;
- Desalination process units (30ML/day);
- Brine discharge via existing ocean outfall;
- Electricity/water supply; and
- Ancillary works.

Submitter details:

- Name: Fluence Corporation, 62 Lygon Street (Level 3), Carlton, Victoria, 3053
- Application number: SSI-8896
- We are **MAKING A COMMENT** regarding the proposal
- We suggest a proved technological solution that can allow the Council to utilize independent desalination units, in a containerized design, suitable for 15MLD or 30MLD, within the defined are of the plant
- We had not made any political donations in the previous two years.

Following is the technical description of the proposed systems for the desalination plant

October 4, 2020

Dear Sirs

We appreciate the opportunity to present our technical proposal for sea water desalination plant for up to 15,000 m^3/day product water, based on ten (10) seawater desalination **NIROBOX SW-MEGA** units, or 30,000 m^3/day product water, based on twenty (20) seawater desalination **NIROBOX SW-MEGA** and optional post-treatment system composed of remineralization unit and chlorination unit.

NIROBOX SW-MEGA is a complete seawater desalination plant, mounted in a 40-foot, temperature-controlled container, allowing quick installation and easy operation, offering a solution for seawater desalination with low consumption of energy and chemicals. Below, please find a technical description of the equipment and proposed commercial conditions. We are at your disposal for further clarifications of technical or commercial discussions

Kind Regards,

Rafi Laderman

Regional Sales Manager

rladerman@fluenceCorp.com

1. COMPANY OVERVIEW

Fluence brings together breakthrough water-treatment technologies and proven delivery platforms to optimize the water cycle for the 21st century, providing the middle market with local, sustainable, and fast-to-deploy water and wastewater treatment and reuse solutions, empowering businesses, and communities worldwide to make the most of their water resources.

We offer an integrated range of services across the complete water cycle. Our solutions include:

- Packaged and pre-engineered decentralized treatment solutions for quick deployment
- Tailored financing packages to finance water and wastewater treatment plants
- Constructing and operating water assets under build-operate-transfer (BOT), operating and financing leases, and reuse-as-a-service (RaaS)

Fluence is a global leader in mid-sized, decentralized water and wastewater solutions. Fluence stands out from the competition by:

- Providing highly efficient packaged and pre-engineered treatment solutions
- Offering a differentiated product line
- Featuring high-quality water professionals with international experience servicing the decentralized market
- Serving all aspects of the water market value chain

With headquarters in New York, Fluence has a global staff of over 300 highly trained water professionals, and more than 7,000 references in 70 countries worldwide. Fluence has ongoing operations in a dozen countries, with core operations in North America, South America, the Middle East, and Europe.

For more information, please visit www.fluencecorp.com.

2. NIROBOX SW OVERVIEW

Each **NIROBOX SW-MEGA** uses three process stages for seawater desalination: disc filtration, ultrafiltration (UF) and reverse osmosis (RO). The system is equipped with the most efficient high-pressure pumps and energy recovery device (ERD) systems in the market and is completely installed in a 40-foot-high-cube container with thermo-acoustic insulation.

2.1 Design For Low CAPEX And OPEX

NIROBOX SW-MEGA includes the following systems (as further described in section 4 herein):

- Pretreatment system with disc filter (DF) plus ultra-filtration (UF) membranes, ensures continuous operation without problems, excellent and constant filtrate quality, at raw water quality up to 20 [NTU]
- Direct feeding from UF to RO - eliminates the need for an intermediate water tank and extra low-pressure RO feed pump, resulting in lower operating costs & footprint
- Direct backwash of UF modules by RO brine, using residual pressure of the brine line – eliminate the need for another operative tank for backwash and backwash pump
- Direct CEB (Chemical enhanced backwash) of UF modules by RO permeate, using residual pressure of the permeate line – eliminate the need for another operative tank for backwash and backwash pump
- Efficient positive displacement, high-pressure pump and advanced energy recovery device (ERD) - Reduces up to 60% of energy costs, compared to units without any ERD system
- High flux/ low energy Reverse Osmosis membranes of latest generation - reduce operating pressures and saves energy
- Flexibility of Operation - all pumps are equipped with variable frequency drives (VFD) that allows a wide operating range
- Fully automatic system with high availability and minimal maintenance – up to 99% availability. (under normal operating conditions, the system downtime is less than 80 hours / year for maintenance and cleaning)

3. SYSTEM OVERVIEW

Hunter Water expressed his interest in receiving Fluence's concept for a packaged seawater desalination plant, for production of 15,000 m3/day or 30,000 m3/day potable water at drinking water quality.

According to the GHD publication "Environmental Impact Statement November 2019", the preferred option for the Belmont Drought Response Desalination Plant – the purpose of the plant is to allow **"an additional level of water security with minimal additional cost compared to a single large or multiple small plants producing only 9 ML/day. To maintain Hunter Water's ability to choose a range of flow rates up to 15 ML/day, a modular design is nominated, such that Hunter Water can choose an initial capacity that retains the ability to expand the plant sensibly to 15 ML/day. The production of up to 15 ML/day can be provided as a combination of smaller desalination modules, meaning that supply can easily be scaled up or down depending on demand and operational circumstances**"

The Fluence packaged **NIROBOX SW-MEGA** can be supplied and/or operated in clusters or each independent. This will allow Hunter Water maximum flexibility in the construction and operation of the desalination plant, either as a combined plant of 15,000 m3/day or in smaller units:

Capacity	No of **NIROBOX SW-MEGA** units
4.5 ML/day	3
7.5 ML/day	5
10.5 ML/day	7
15 ML/day	10

The water treatment system proposed here is composed of the following major elements:

A) Ultra-filtration system

B) Reverse Osmosis system

C) Optional Post-treatment system combined of:

    a. Disinfection by chemical dosing/UV

    b. Remineralization by calcite filters/chemical dosing

D) Auxiliary equipment consists of:

    a. Cleaning In Place system for the UF and RO systems

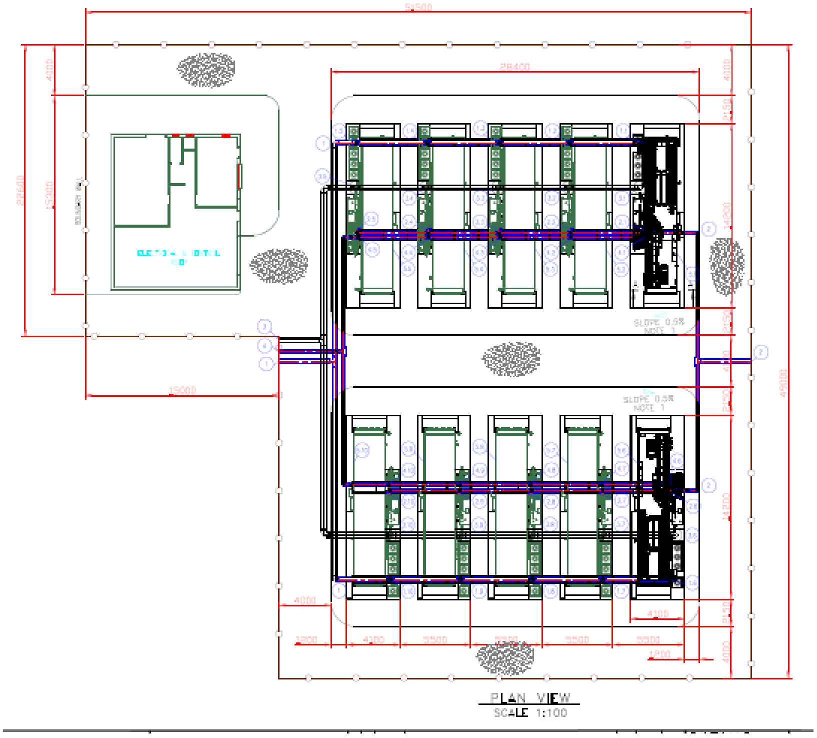
    b. Pressurized air system

    c. HVAC unit

    d. Feed pumps/product delivery pumps/brine disposal pumps/feed pumps control

E) Supervision of installation, Start-up, commissioning, and training

Conceptual Layout of a 15,000 m3/day desalination plant with **NIROBOX SW-MEGA** units



The conceptual design portrays the main treatment components for a desalination plant of 15,000 m3/day, comprised of 10 **NIROBOX SW-MEGA** units, or 30,000 m3/day, with two arrays of the above. The proposed will be offered not including the intake, storage tanks, distribution unit and discharge system.

Note: due to the unique design of the **NIROBOX SW-MEGA** the desalination plant does not need a UF Filtrate storage tank and UF Backwash pump. This feature can save considerable space, construction and operational costs.

The basic advantages of this concept are:

- The simplicity and flexibility of the installation – the investment in the major equipment can be planned gradually, over time.
- With the **NIROBOX SW-MEGA**, the system can be supplied and/or operated in the modules that were recommended by GHD, in their report from November 2019.
- The containerized systems can minimize the required civil works for the construction of the plant.
- The containerized system can fit in the boundaries of the defined area for the plant, even for a 30,000 m3/day capacity.

SW

SEAWATER

NIROBOX™ SW

A modular, scalable & highly-efficient **seawater desalination solution**

fluence

NIROBOX SW

A New Generation Decentralized Water Treatment Solution

Leading the way in water, wastewater and reuse solutions, Fluence believes that everyone, everywhere deserves access to clean water. The NIROBOX™ family of containerized water treatment solutions challenges convention by providing advanced treatment technologies in an affordable and compact package. Nirobox offers the industry's smallest overall footprint, which makes the units ideal for the industrial, municipal, and commercial markets.

NIROBOX SW is a modular, high-output and highly-efficient **seawater desalination** solution that offers pre-treatment, reverse osmosis and energy recovery device (ERD) – all housed in a single, self-contained 40 foot shipping container. The use of superior components ensures the production of high quality product water under continuous heavy-duty conditions with minimal O&M.

Offering unrivalled capacity, a single compact NIROBOX SW container can produce up to 1,500 cubic meters per day of clean water, making it the most compact plant-in-a-box with an extremely small overall footprint.

Technically Advanced, Sustainable SWRO Desalination System

NIROBOX SW offers recovery rates of up to 50%, the lowest chemical and energy consumption in the market, reducing overall enviromental impact.

NIROBOX SW's patent-pending process includes a cleaning process for the ultrafiltration membranes that inhibits microorganism growth and scaling. This natural disinfecting process reduces energy and chemical requirements, and minimizes the plant's ecological footprint. Moreover, Nirobox SW features a work-exchanger energy recovery device with the lowest energy consumption in the industry.

Key Advantages

- **Cost-effective**: pre-assembled, housed in a standard ISO shipping container. Engineered for fast deployment, simple operation and maintenance.
- **Sustainable**: low energy consumption and chemical usage reduces the enviro nmental impact. The unique patent pending design provides a **high recovery** rate which means less waste discharge.
- **Compact**: small footprint minimizes site impact, lowers the cost of site development, and ensures easy expansion.
- **Flexibility and scalability**: intended for large-scale water needs, with smart pre-engineering and design to suit any site requirements, facilitating fast delivery, integration, commissioning and operation.

NIROBOX SW modular desalination solutions are ideal for:

- Municipalities and growing communities
- Construction sites
- Housing developments
- Commercial establishments
- Resorts, hotels & golf clubs
- Remote oil and gas facilities
- Power plants
- Mining camps & operations

Smart Operations

Fully automated, remotely monitored and operated systems

- Keeps ongoing equipment, operation and maintenance expenses in check.
- PLC based HMI with remote monitoring.
- Data and reports easily accessible from anywhere on any platform.
- Real-time alerts for system malfunctions or abnormal performance.

Modular and Scalable

NIROBOX building blocks are modular and can be adapted to your requirements, providing an independent solution on virtually any scale, from single, self-contained units to large water treatment plants.

Main Advantages:

- **Modular**
- **Fast delivery and deployment**
- **Lower CAPEX**
- **Lower Operation and Maintenance costs**

NIROPLANT™

- Niroplant uses the boxes as stand-alone units with a centralized control unit and optional post-treatment. This allows the plant to be scaled up or down without losing the individual operability of each box.
- Niroplants can handle up to 20,000 m³/d.
- Units can be easily removed and relocated according to changing requirements.

NIROSITE™

As an end-to-end solution, Nirosite achieves greater operating and maintenance efficiencies for larger capacity plants.

- Nirosite installations feature centralized peripheral functions, including control, air compression, chemical flushing, and clean-in-place (CIP).
- Expandable through the addition of operating clusters.

Specifications

	Model		
	NIROBOX SW-M	NIROBOX SW-XL	NIROBOX SW-MEGA
Operating Parameters			
Permeate rate	500 m^3/d (92 gpm)	1,000 m^3/d (183 gpm)	1,500 m^3/d (275 gpm)
Feed rate	42 m^3/h	84 m^3/h	125 m^3/h
Recovery	50%	50%	50%
Population served	2,500	5,000	7,500
Energy consumption (kWh/m^3)	2.45	2.45	2.2
Turbidity	< 20 NTU		
Oil and grease	< 1.5 mg/l		
TDS (Total Dissolved Solids)	15,000 - 45,000 mg/l		
Temperature	from 5° to 35° C (41° to 95° F)		
Number of containers	1x40'	1x40'	1x40'
Container weight	11.5T	14T	16.5 T

* Production based on 36,000 ppm and 25°C feed water

Options	
Pretreatment	Dissolved air flotation (DAF) Multimedia filtration Activated carbon filters Clarification
Post-treatment	Remineralization pH adjustment Ultraviolet / chlorine disinfection

* Additional pre or post-treatment options are available to tailor the standard unit to your requirements, as well as other process configuration options

Fluence profile

Formed in 2017 following the consolidation of independent water treatment solution providers Emefcy and RWL Water, Fluence Corporation was established with the vision of becoming the leading global provider of fast-to-deploy smart decentralized and packaged water and wastewater treatment solutions. With some 300 highly-trained water professionals with experience operating in 70 countries, Fluence provides local and sustainable treatment and reuse solutions while empowering businesses and communities worldwide to make the most of their water resources.

With core operations in North America, South America, the Middle East, Europe and China, Fluence offers an integrated range of solutions across the entire water cycle - from early stage evaluation, through design and delivery, to ongoing support, optimization of water-related assets, operations and financing.

APPENDIX D RESPONSE TO DPIE REQUEST FOR CLARIFICATION

Appendix D – Hunter Water Summary Document

The NSW Department of Planning, Industry and Environment (DPIE) provided Hunter Water with a letter after the exhibition of the Amendment Report. The DPIE letter requested additional information and/or clarification on a number of matters related to the Amendment Report. The DPIE letter is provided in Appendix A of the Supplementary Response to Submissions Report. Hunter Water has prepared this Summary Document in response to the DPIE letter.

DPIE letter Attachment 1: Key Issues

"The Department requests additional information and/or clarification on the following:

Consistency and relevance across documentation

There are inconsistencies across the supplementary technical reports provided to support the preferred project (i.e. some reports provide a comprehensive list of mitigation measures that apply to the whole preferred project, some provide the measures that apply to the amended sections only, some provide a full revised report and some provide an addendum report).

The Department requests that reports are made consistent or that a comprehensive summary document be provided that clearly stipulates all sections of the EIS and associated appendices that remain relevant and applicable to the preferred project as a whole."

Hunter Water Response

Mitigation measures

A comprehensive and consolidated list of mitigation measures for the Amended Project are provided in Appendix E of the Amendment Report.

Consistency and relevance across documentation

The DPIE letter requested that the Project's reports are made consistent, or that a comprehensive summary document be provided *"that clearly stipulates all sections of the EIS and associated appendices that remain relevant and applicable to the preferred project as a whole"*.

Hunter Water has prepared this Summary Document to address the DPIE request for clarification. This Summary Document confirms which sections of the Environmental Impact Statement (EIS) and specialist reports remain relevant and applicable; and where the Amendment Report (AR) and specialist reports update or supersede sections of the EIS and specialist reports.

EIS Chapters

EIS Chapter 1 Introduction

The Introduction of the EIS remains valid as it provides an overview of Hunter Water's role in providing water services to the Lower Hunter Region, with a population of over 600,000 people. It describes the effects that the drought has had on much of NSW, and the role that desalination plays in Hunter Water's response to the drought. This includes the background and objectives of the Project.

The key features of the Project, as described in Section 1.4.2 of the EIS Introduction, have been updated by Sections 3.2 (Strategic Context) and 3.3 (Description of the Amendments) of the AR. Section 1.5 of the EIS Introduction (Overview of the planning and approvals process) has been updated by Section 3.4 (Statutory Context) of the AR.

EIS Chapter 2 Needs and options considered

EIS Chapter 2 (Needs and options considered) remains relevant as a description of the strategic need for, and justification to proceed with, desalination, together with the selection of the preferred site. Section 3.3 of the AR (Description of the amendments) updates and supersedes EIS Sections 2.4.1.4 (Capacity of the desalination plant) and 2.5 (Intake options).

EIS Chapter 3 Site context

EIS Chapter 3 (Site context) remains relevant and applicable.

EIS Chapter 4 Project description

EIS Chapter 4 (Project description) has been updated by AR Section 3.3 (Description of the amendments) and AR Appendix D (Project description).

EIS Chapter 5 Regulatory framework

EIS Chapter 5 (Regulatory framework) remains relevant and applicable. This section has also been updated by AR Section 3.4 (Statutory context).

EIS Chapter 6 Consultation

EIS Chapter 6 (Consultation) remains relevant. AR Section 2.2 (Stakeholder engagement) and AR Appendix C (Stakeholder consultation letters) update this EIS chapter.

EIS Chapter 7 Key issues

EIS Chapter 7 (Key issues) detailed the findings of the environmental assessment completed in accordance with the Secretary's Environmental Assessment Requirements (SEARS). It detailed the potential impacts of the EIS design, together with management and mitigation measures to manage, reduce or eliminate those potential impacts.

Elements of the environmental assessments completed for the EIS remain relevant and applicable. Others have been updated by the environmental assessments completed for the amended Project in the AR. The amendments to the Project's design, in particular the increase in plant capacity and the amended seawater intake design, were assessed and documented in AR Section 3.5 and 3.6.

AR Section 3.7 provides a summary of the potential environmental impacts that would result from the proposed amendments to the Project's design. AR Section 3.8 details the additional mitigation and management measures that have been developed for the proposed design changes. A comprehensive and consolidated list of mitigation measures developed to manage, minimise or eliminate impacts for the Amended Project are provided in Appendix E of the Amendment Report.

The following sections address DPIE's request for clarification on the assessment of key issues: *"which sections of the EIS and associated appendices that remain relevant and applicable to the preferred project as a whole."*

Table 1 details the status of the environmental assessments completed in the EIS. It describes which sections of the EIS remain relevant and applicable, as there would be no significant impacts from the proposed design changes.

Table 1 details where the environmental assessments in the EIS have been updated or superseded by sections of the AR. These sections of the AR assess the larger building footprint, changes to resource usage from the increased plant capacity, and the amended seawater intake design. It also describes which EIS sections are now redundant, such as assessments of the previous sub-surface intake design. The AR column of Table 1 denotes where the AR updates the EIS due to the:

- Larger building footprint
- Increased production capacity
- New assessment for scope addition - direct ocean intake
- Redundant assessment for scope removal – sub-surface intake; or
- No significant change.

Table 1 EIS and Amendment Report

7.1 Soils, geology and contamination	
EIS	AR
EIS Section 7.1 Soils, geology and contamination and EIS Appendix H (Contamination) EIS Section 7.1 remains relevant and applicable for the assessment of potential soil and geology impacts associated with construction of the Project. The field assessments completed for the EIS covered the area containing the larger construction footprint required for the increased plant capacity. This includes the assessment of potential Acid Sulphate Soils (ASS), contamination within the water treatment plant footprint and exposure to erosion. EIS Section 7.1 and EIS Appendix H (Contamination) have been updated by AR Sections 3.5.2.1 and 3.6.2.1, and AR Appendix G (Contamination).	AR Sections 3.5.2.1 and 3.6.2.1, AR Appendix G (Contamination) and AR Appendix H (Mine subsidence) **Larger building footprint** **New assessment for scope addition – direct ocean intake** The assessment of potential contamination impacts has been updated in AR Sections 3.5.2.1 and 3.6.2.1, and AR Appendix G (Contamination). The AR provides an updated assessment of potential contamination impacts associated with the larger water treatment plant footprint and the amended seawater intake design. Section 3.5.2.1 assesses potential asbestos contamination that was located at one test pit during sampling. The assessment of potential impacts from mine subsidence in Section 7.1 of the EIS has been updated by Sections 3.5.2.1 and 3.6.2.1 of the AR, and AR Appendix H (Mine subsidence). The AR assesses potential impacts associated with the amended direct ocean intake design. Supplementary Submissions Report Appendix E – Detailed Site Investigation Hunter Water completed a Detailed Site Investigation (DSI) in October 2020. The DSI was completed in response to the submission received from the EPA after exhibition of the EIS in 2019. The EPA's submission required that a DSI be completed prior to construction. DPIE requested that Hunter Water complete the DSI prior to determination of the planning approval. This request was made so that potential timing issues could be avoided. Potential timing issues may include the discovery

	of significant contamination delaying the commencement of construction and placing the program at risk. The DSI confirmed that there is no significant contamination at the site that would pose a risk to human health or the environment. Minor contamination that was detected is consistent with surrounding sites. This would be managed by mitigation and management measures that would be incorporated into a Contamination Site Management Plan (CSMP). The CSMP will be prepared as part of the Construction Environmental Management Plan prior to construction at the detailed design stage.
7.2 Water Resources	
EIS	AR
EIS Section 7.2 Water resources and EIS Appendix D (Groundwater) EIS Section 7.2 remains relevant and applicable for the assessment of potential surface water impacts during construction and operation of the water treatment process plant, and groundwater impacts during construction of the water treatment process plant. The surface water assessment has been updated by the AR Section 3.5.2.2. The assessment of potential groundwater impacts during construction and operation of the sub-surface intake have been superseded by the AR Section 3.6.2.2. EIS Appendix D (Groundwater) has been superseded by AR Appendix J (Groundwater) due to the change in seawater intake design, and the reduction in operational groundwater impacts.	AR Section 3.5.2.2, AR Appendix I (Stormwater) and AR Appendix J (Groundwater) **Larger building footprint** **Redundant assessment for scope removal – sub-surface intake** AR Section 3.5.2.2 and AR Appendix I (Stormwater) provide additional surface water assessments for the water process treatment plant's increased footprint. Section 3.5.2.2 and AR Appendix I include a description of the stormwater management system that has been incorporated into the amended design. The amended design would involve construction of a direct ocean intake, in replacement of the sub-surface intake assessed in the EIS. The amended design would change the source of seawater from the sub-surface groundwater that was assessed in the EIS. This would remove potential operational groundwater impacts that were assessed in Section 7.2.3.1 of the EIS.

	AR Sections 3.5.2.2, 3.6.2.2 and AR Appendix J (Groundwater) detail the changes to potential groundwater impacts during construction of the amended water treatment plant and the amended seawater intake, and changes to operational groundwater impacts from the amended seawater intake design.
7.3 Terrestrial and freshwater biodiversity	
EIS	AR
EIS Section 7.3 Terrestrial and freshwater biodiversity and EIS Appendix E (Biodiversity) EIS Section 7.3 and EIS Appendix E (Biodiversity) remain mostly relevant and applicable for the assessment of potential impacts on terrestrial biodiversity except as noted below. EIS Section 7.3.3 has been superseded by EIS AR section 3.5.2.3 due to the proposed change in intake design to a direct ocean intake, thereby removing potential operational impacts on groundwater EIS Section 7.3.5 has been superseded by the offsets and summary sections of EIS AR section 3.5.2.3, due to the increase in the overall construction footprint.	AR Sections 3.5.2.3, 3.6.2.2, AR Appendix J (Groundwater) and AR Appendix K (Biodiversity) **Larger building footprint** **Redundant assessment for scope removal – sub-surface intake** EIS Section 7.3 and EIS Appendix E (Biodiversity) have been updated by AR Section 3.5.2.3 and AR Appendix K (Biodiversity), which assess potential biodiversity impacts from the larger building construction footprint. Operation of the amended seawater intake would reduce potential impacts on terrestrial and freshwater biodiversity values that are associated with groundwater. The amended seawater intake would significantly reduce operational impacts on groundwater and groundwater reliant biodiversity values.
7.4 Marine biodiversity	
EIS	AR
EIS Section 7.4 Marine biodiversity, EIS Appendix K (Marine) EIS Section 7.4 and EIS Appendix K (Marine) remains relevant and applicable as noted below. EIS Section 7.4.1 (Methodology) remains valid as a description of the	AR Section 3.5.2.4, AR Section 3.6.2.3, AR Appendix L (Marine) and Appendix M (Brine Modelling) **Increased production capacity** **New assessment for scope addition – direct ocean intake**

methodology used to assess potential impacts on marine biodiversity. This section has been updated by AR Sections 3.5.2.4 and 3.6.2.3. EIS Section 7.4.2 (Existing environment) remains valid for the description of existing ambient environmental conditions including seawater characteristics, water quality, temperature, turbidity and chemical composition, benthic and epibenthic communities, fish assemblages and conservation values. EIS Sections 7.4.3 (Impact Assessment), 7.4.4 (Mitigation Measures) and EIS Appendix K (Marine) have been updated by the AR and AR Appendix L (Marine).	EIS Section 7.4.1 (Methodology) has been updated by AR Section 3.5.2.4, which provides an updated methodology for the assessment of potential impacts on water quality and marine biodiversity due to the increase in plant capacity, and consequent increase in brine discharge. EIS Section 7.4.2 (Existing environment) has been supplemented by AR Section 3.6.2.3, which describes the benthic and epibenthic environments in the context of the direct ocean intake design. EIS Section 7.4.2.2 described the existing groundwater water quality as it related to suitability for use as the raw seawater source in the previous sub-surface intake design. EIS Section 7.4.2.2 has been updated by AR Section 3.6.2.3 and AR Appendix J (Groundwater). EIS Section 7.4.3 described potential impacts on marine biodiversity from brine discharge via the existing Belmont WWTW outfall. AR Section 3.5.2.4, AR Appendix L (Marine) and Appendix M (Brine Modelling) assess the potential impacts of the increased brine discharge volumes from the increased plant capacity. AR Section 3.6.2.3 provides a new assessment of potential impacts on marine biodiversity from the construction and operation of the direct ocean intake, including benthic and epibenthic communities, fish assemblages, marine mammals, eggs, larvae and smaller species potentially impacted. AR Sections 3.5.2.4 and 3.6.2.3, AR Appendix E (Mitigation Measures), Appendix L (Marine) and Appendix M (Brine Modelling) update EIS Section 7.4.4 (Mitigation Measures) to account for the increase in plant capacity and the amended direct ocean intake design.
7.5 Coastal Processes	
EIS	AR

EIS Section 7.5 Coastal Processes and EIS Appendix M (Coastal Processes) EIS Section 7.5 and EIS Appendix M (Coastal Processes) remain mostly relevant and applicable except as noted below. EIS Section 7.5.3.1 described the potential coastal erosion and coastal inundation impacts from constructing and operating the water process treatment plant. The increase in plant capacity would not materially affect the assessments contained in EIS Section 7.5.3.1. EIS Section 7.5.3.2 assessed potential impacts on coastal erosion and coastal inundation from the construction and operation of the previous sub-surface intake design. EIS Section 7.5.3.2 and Appendix M (Coastal Processes) have been updated by AR Section 3.6.2.4 and AR Appendix N (Coastal Processes).	AR Section 3.6.2.4 and AR Appendix N (Coastal Processes) **Larger building footprint** **New assessment for scope addition – direct ocean intake** **Redundant assessment for scope removal – sub-surface intake** AR Section 3.6.2.4 and AR Appendix N (Coastal Processes) provide an updated assessment of potential coastal erosion and coastal inundation impacts resulting from the amended Project. EIS Section 7.5.3.2 has been superseded by AR Section 3.6.2.4, which assesses the potential impacts from the construction of the direct ocean intake.
7.6 Social	
EIS	AR
EIS Section 7.6 Social and EIS Appendix N (Social) EIS Section 7.6.3 and EIS Appendix N (Social) remains relevant and applicable as an assessment of the potential social impacts of the project	AR Section 3.6.2.5 **No significant change** AR Section 3.6.2.5 provides additional assessment of potential social impacts resulting from the increased plant capacity and amended intake design. This assessment confirms that the EIS findings remain valid.
7.7 Sustainability	
EIS	AR
EIS Section 7.7 Sustainability EIS Section 7.7 remains relevant and applicable as an assessment of sustainability considerations for the Project, particularly management	AR Section 3.5.2.9 **No significant change** AR Section 3.5.2.9 provides an updated assessment of potential

systems, procurement and purchasing, water consumption and materials.	greenhouse gas impacts from construction of the larger building footprint. It also assesses operational impacts from increased electricity consumption due to the larger plant capacity. AR Section 3.6.2.9 provides an updated assessment of potential greenhouse gas impacts from the construction of amended seawater intake.
7.8 Hazards and risk	
EIS	AR
EIS Section 7.8 Hazards and risk EIS Section 7.8 remains relevant and applicable as an assessment of the Project's potential to be hazardous or offensive as the proposed amendments would not increase the potential for the Project to be hazardous or offensive.	**No significant change**
7.9 Aboriginal heritage	
EIS	AR
EIS Section 7.9 Aboriginal heritage and EIS Appendix G (ACHAR) EIS Section 7.9 and EIS Appendix G (ACHAR) remain mostly relevant and applicable except as noted below. AR Section 3.5.2.6 and AR Appendix O (ACHAR) provide updated assessments for the larger building footprint.	AR Section 3.5.2.6 and AR Appendix O (ACHAR) **Larger building footprint** **New assessment for scope addition – direct ocean intake** AR Section 3.5.2.6 and AR Appendix O (ACHAR) provide an updated assessment. The updated assessment accounts for the larger construction footprint of the increased plant capacity, and for new areas of disturbance required for construction of the amended seawater intake design.
7.10 Non-Aboriginal heritage	
EIS	AR

<table>
<tr><td>EIS Section 7.10 Non-Aboriginal heritage and EIS Appendix F (HIA)
EIS Section 7.10 and EIS Appendix F (HIA) remain relevant and applicable for the assessment of non-Aboriginal heritage issues.</td><td>No significant change</td></tr>
<tr><td colspan="2">7.11 Traffic and transport</td></tr>
<tr><td>EIS</td><td>AR</td></tr>
<tr><td>EIS Section 7.11 Traffic and transport and EIS Appendix O (Traffic)
EIS Section 7.11 and EIS Appendix O (Traffic) remain mostly relevant and applicable except as noted below. AR Section 3.6.2.6 and AR Appendix P (Traffic) provide updated assessments.</td><td>AR Section 3.6.2.6, AR Appendix P (Traffic) and AR Appendix L (Marine)
Larger building footprint
New assessment for scope addition – direct ocean intake
The assessment of construction traffic impacts in EIS Section 7.11 has been updated by AR Section 3.6.2.6 and AR Appendix P (Traffic). The updated traffic assessment considers higher traffic volumes required for the increased capacity of the water treatment process plant, and changes to traffic and transport requirements for the construction of the direct ocean intake design.
AR Section 3.6.2.6 and AR Appendix L (Marine) assess potential impacts from marine traffic and transportation for the construction and operation of the direct ocean intake. This assessment was not completed for the EIS due to the previous sub-surface intake design.</td></tr>
<tr><td colspan="2">7.12 Noise and vibration</td></tr>
<tr><td>EIS</td><td>AR</td></tr>
</table>

EIS Section 7.12 Noise and vibration and EIS Appendix P (Noise and vibration) EIS Section 7.12 and EIS Appendix P (Noise and Vibration) remain mostly relevant and applicable except as noted below. AR Sections 3.5.2.7, 3.6.2.7 and AR Appendix Q (Noise) provide updated assessments noise impacts from the construction of the larger water process treatment plant and the direct ocean intake. The management and mitigation measures detailed in the EIS would be appropriate to manage these potential impacts.	AR Sections 3.5.2.7, 3.6.2.7 and AR Appendix Q (Noise) **Larger building footprint** **New assessment for scope addition – direct ocean intake** AR Section 3.5.2.7 and AR Appendix Q (Noise) provide an updated impact assessment for the construction of the increased plant capacity and the longer construction timeframe. AR Section 3.6.2.7 and AR Appendix Q (Noise) provide a new assessment of potential noise and vibration impacts associated with the construction of the direct ocean intake.
7.13 Waste management	
EIS	AR
EIS Section 7.13 Waste management EIS Section 7.13 remains mostly valid except as noted below. Construction of the larger water process treatment plant would increase the volumes of waste generated during construction. This increase would not be significant. The higher production capacity would increase the volumes of brine to be discharged via the Belmont WWTW outfall during operation. AR Appendix M (Brine Modelling) provides an updated assessment for the increase brine discharges. Management and mitigation measures identified in the EIS would be appropriate to minimise impacts.	AR Appendix M (Brine modelling) **Increased production capacity** The increased capacity of the water process treatment plant would increase the volumes of brine to be discharged via the Belmont WWTW outfall during operation. The assessment, detailed in AR Appendix M (Brine Modelling) determined that management measures detailed in the EIS would be sufficient to appropriately manage brine waste.
7.14 Visual amenity	
EIS	AR
EIS Section 7.14 Visual amenity and EIS Appendix Q (Visual) EIS Section 7.14 and EIS Appendix Q (Visual) remain mostly valid except as noted below. EIS Section 7.14 and EIS Appendix Q (Visual) have been updated by AR Section 3.5.2.8 and AR Appendix R (Visual) which assess the	AR Section 3.5.2.8, 3.6.2.8 and AR Appendix R (Visual) **Larger building footprint** AR Section 3.5.2.8 provides an updated visual impact for the increased plant capacity. AR Section 3.6.2.8 provides an updated visual impact

potential visual impacts associated with the construction and operation of the larger water process treatment plant. AR Section 3.6.2.8 assesses potential visual impacts associated with the construction of the direct ocean intake. The visual impacts associated with the operation of the direct ocean intake would not change from those described in EIS Section 7.14 because both designs are largely sub-surface and would not have visual impacts once constructed.	assessment to account for the changed impacts associated with constructing the direct ocean intake. AR Appendix R (Visual) provides greater details on the updated visual impact assessments for the water process treatment plant and direct ocean intake.
7.15 Air quality	
EIS	AR
EIS Section 7.15 Air quality EIS Section 7.15 remains relevant and appropriate for the assessment of potential air quality impacts. Impacts to air quality, in the form of dust generation and vehicle emissions, would not increase in magnitude as a result of the amended Project. Impacts would occur over a longer period due to longer construction timeframes. The management and mitigation measures detailed in the EIS would be appropriate to manage these potential impacts.	N/A
7.16 Greenhouse Gas	
EIS	AR
EIS Section 7.16 Greenhouse gas EIS Sections 7.16.1 and 7.16.2 remain relevant and appropriate. Section 7.16.1 establishes the relevant policies and guidelines for greenhouse gas assessments, and Section 7.16.2 sets the local, state and national contexts for greenhouse gas assessments. EIS Section 7.16.3 (potential emissions) has been updated by AR Sections 3.5.2.9 and 3.6.2.9.	AR Sections 3.5.2.9 and 3.6.2.9 **Larger building footprint** **Increased production capacity** AR section 3.5.2.9 assesses greenhouse gas emissions from constructing and operating the larger water process treatment plant capacity. This includes an assessment of the operational greenhouse gas impacts of the

	electricity required to operate the Project at a larger capacity. AR section 3.6.2.9 assesses the greenhouse gas impacts from constructing the direct ocean intake, which did not form part of the EIS assessment.
7.17 Human health	
EIS	AR
EIS Section 7.17 Human health Construction impacts from the larger water process treatment plant and direct ocean intake would not change the assessment of potential human health impacts contained within EIS Section 7.17.	AR Appendix M (Brine Modelling) **Increased production capacity** **New assessment for scope addition – direct ocean intake** AR Appendix M (Brine Modelling) assesses the potential impacts on human health from the operation of the amended Project, including increased brine discharges from the larger water process treatment plant, and the operation of the direct ocean intake.
7.18 Cumulative impacts	
EIS	AR
EIS Section 7.18 Cumulative impacts EIS section 7.18 remains relevant and appropriate as an assessment of potential cumulative impacts from the construction and operation of the Project.	**No significant change**

Chapter 8 Environmental management

EIS Chapter 8 Environmental Management has been updated by AR Section 3.8 Proposed Additional Mitigation Measures. AR Section 3.8 details the additional mitigation and management measures that have been developed for the proposed design changes.

A comprehensive and consolidated list of mitigation measures that have been developed to manage, minimise or eliminate impacts for the Amended Project are provided in Appendix E of the Amendment Report.

Chapter 9 Conclusion

EIS Chapter 9 Conclusion remains largely relevant and applicable. It provides a justification for the Project, particularly in relation to its function as a response to severe drought, and in the context of the Lower Hunter's water storages.

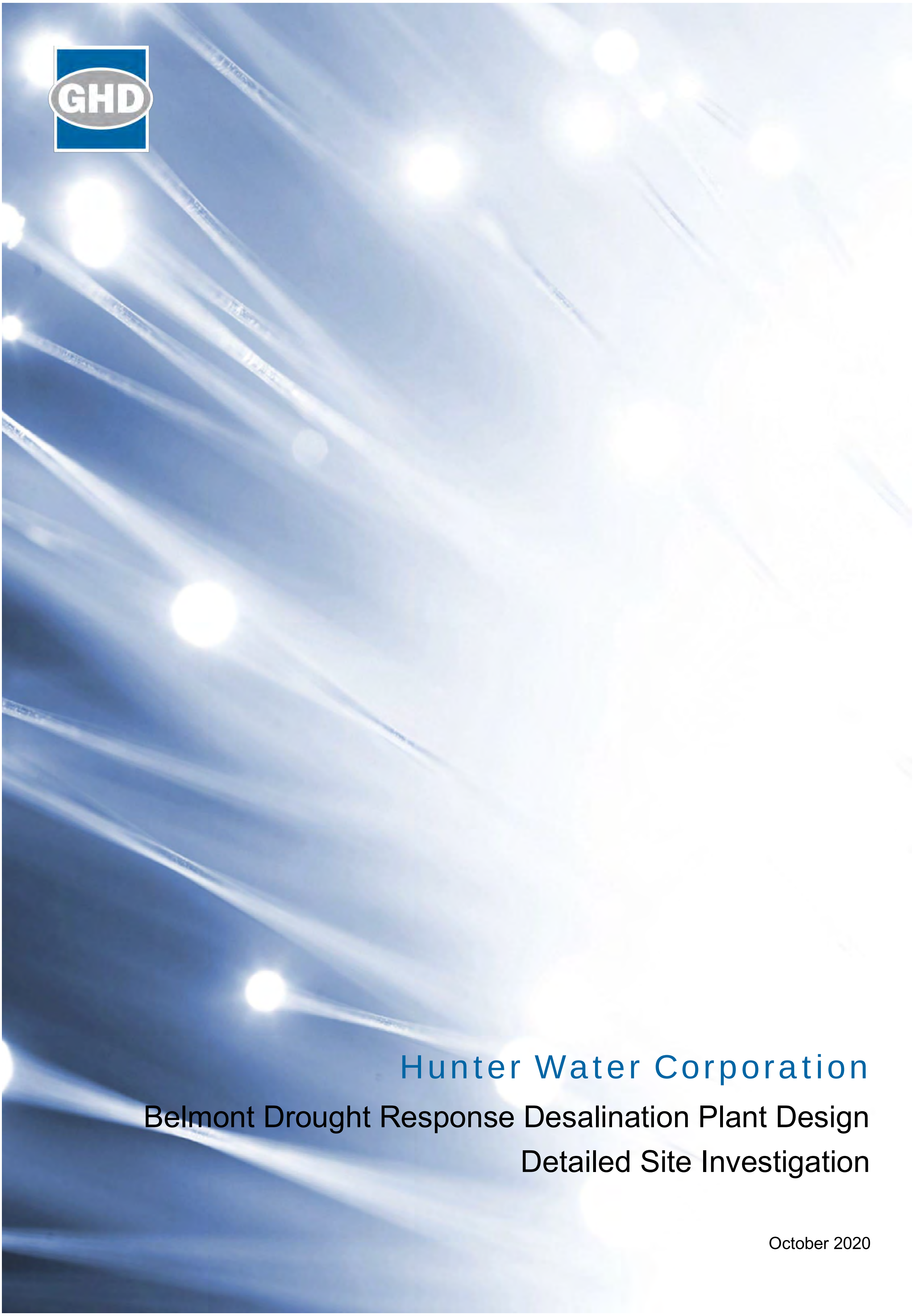
AR Section 4 Evaluation of Merits provides an update to the justification of the Project, incorporating the evaluation of the proposed design amendments. It confirms that the amended Project would be justified and would be beneficial in meeting the objectives of the Project, which are to:

- Provide a climate independent source of water in the event of an extreme drought
- Slow the depletion of existing water storages in an extreme drought.

The Project would be constructed and operated as a last resort in the event that water storages reach critical levels. The Amended Project would allow up to 30ML/d of potable water to be produced and added to the local Hunter Water network.

The EIS and AR have documented the potential environmental impacts of the Project, considering both negative and environmental impacts. The concept design has been informed by the findings of the EIS and AR, minimising impacts while maintaining Project feasibility. The EIS and AR have demonstrated that the Project would not have a significant environmental impact through the implementation of the proposed management and mitigation measures. The benefits of the Project would outweigh the negative impacts.

APPENDIX E DETAILED SITE INVESTIGATION



Hunter Water Corporation

Belmont Drought Response Desalination Plant Design
Detailed Site Investigation

October 2020

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Appendices

List of abbreviations

Abbreviation	Definition
ANZECC	Australian and New Zealand Environmental Conservation Council
ACM	Asbestos Containing Material
ALS	Australian Laboratory Services
ASS	Acid Sulfate Soil
bgl	below ground level
BaP	Benzo(a)pyrene
BTEXN	Benzene, Toluene, Ethyl benzene, Xylenes, Naphthalene
CLM Act	Contaminated Land Management Act 1997(incorporating amendments made by the Contaminated Land Management Amendment Act 2003)
CSMP	Contaminated Soils Management Plan
NSW DEC	Former Department of Environment and Conservation. The DEC was formed on 1 July 2006 from the amalgamation of the Department of Environment and the Department of Conservation and Land Management.
EIA	Environmental Impact Assessment
EIL	Ecological Investigation Level
ESL	Ecological Screening Level
NSW EPA	NSW Environment Protection Authority
Ha	Hectare
HIL	Health Investigation Level (relating to defined land use scenario)
HSL	Health Screening Level
ID	Identification
LOR	Limit of Reporting
m bgl	Metres below ground level
mg/kg	milligrams per kilogram (generally equivalent to parts per million)
mg/L	Milligrams per litre
NATA	National Association of Testing Authorities of Australia
ND	not detected (above laboratory LOR)
NEPC	National Environment Protection Council
NEPM	National Environment Protection (Assessment of Site Contamination) Measure
OCP	Organochlorine Pesticide
PACM	Potential Asbestos Containing Material
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PFAS	Per- and polyfluoroalkyl substances
PID	Photo-Ionisation Detector
QA	Quality Assurance
QC	Quality Control
RPD	Relative Percent Difference
SOP	Standard Operating Procedure
TEQ	Toxic Equivalency Quotient
TOC	Top of Casing
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons

1. Introduction

1.1 Background

GHD Pty Ltd (GHD) was commissioned by Hunter Water Corporation (Hunter Water) to undertake a Detailed Site Investigation (DSI) to investigate the Project Area (also referred to as “the Site”) of the proposed drought response desalination plant development. The Site is located off Ocean Park Road Belmont, NSW, on the southern portion of Hunter Water owned land and to the south of the current Belmont Wastewater Treatment Works (Belmont WWTW) site and to the east of the Pacific Highway. The location, layout and amended boundary of the Site is presented in Figures 1 and 2, Appendix A.

Like much of NSW, the Lower Hunter region continues to experience ongoing drought conditions. In response to the drought, Hunter Water is rolling out a program of drought response measures as outlined in the 2014 Lower Hunter Water Plan (LHWP). Measures include the staged introduction of water restrictions, implementation of a broad range of water conservation and water loss initiatives as well as various operational measures. The 2014 LHWP identified the implementation of emergency desalination as a measure of last resort in response to a severe drought, and would only be implemented if water storage levels reached a critical point and all other measures have been implemented.

An Environmental Impact Statement (EIS) (GHD, 2019a) was prepared to support a development application for the Project as State Significant Infrastructure (SSI). The EIS was publicly exhibited by DPIE for 28 days from 21 November 2019 to 19 December 2019.

The Project described in the EIS included the construction and operation of a desalination plant, designed to produce up to 15 megalitres per day (ML/day) of potable water, with two sub-surface intake structures.

Since commencing this Project, Hunter Water has begun a major review of the 2014 LHWP, now referred to as the Lower Hunter Water Security Plan (LHWSP). The LHWSP seeks to determine the preferred portfolio of supply and demand side options to ensure a sustainable and resilient supply for the region, over the long term as well as during drought. This work indicates that a drought response portfolio including a desalination plant at Belmont with a nominal production capacity of up to 30 ML/day would provide the best balance of meeting the community’s needs should a severe drought occur, while still providing value for money. In addition to the proposed increase in plant capacity, further design development and assessment following completion of the EIS has identified that a direct ocean intake would perform considerably better than a sub-surface option across key criteria including, reliability, efficiency and scalability.

An EIS Amendment Report has been prepared in accordance with the requirements for SSI under Part 5.2 and clause 55 of the *Environmental Planning and Assessment Regulation* 2000 and the revised SEARs. The EIS Amendment report was publicly exhibited by DPIE for 28 days from 10 September to 7 October 2020.

GHD were engaged to prepare a Detailed Site Investigation (DSI) by Hunter Water to respond to a requirement by the Environment Protection Authority (EPA) received in response to the EIS to prepare a DSI prior to commencing any site preparation works. The DSI has been prepared based on results from previous investigations completed by GHD (2019 and 2020) and results of additional sampling undertaken within the northern portion of the Site which had not been previously sampled.

1.2 Key features of the Amended Project

The Amended Project for the construction and operation of a drought response desalination plant, designed to produce up to 30 ML/day of potable water, includes the following key components:

- **Direct ocean intakes** – To ensure provision of sufficient quantities of raw feed water for the water treatment process plant, a direct ocean intake is proposed as part of the Amended Project, as follows:
  - *Sea Water Pump Station (On-shore),* including a central well, screening and pump housing, proposed to be a concrete structure (referred to as a wet well) of approximately nine to 11 m diameter, installed to a depth up to 20 m below existing surface levels.
  - *Intake pipeline,* the indicative pipeline alignment is approximately 1000 m in length, extending outwards from the central housing to the off-shore intake structure. Construction of the intake pipeline would be determined during detailed design; however, the following construction methodologies/ considered and assessed included Construction method 1 (CM1) Horizontal directional drilling (HDD) and (CM2) Pipejacking/micro-tunnelling.
  - *Intake structure (Off-shore),* the intake structure would be in the form of a horizontal intake with a velocity cap structure and low through-screen velocity to minimise impacts on marine species and habitat. The intake structure would be 5 m in diameter, have a minimum of 5 m clearance from the seabed and a depth of approximately 18 m of water.
- **Water treatment process plant** – The water treatment process plant would be houses in buildings which would be placed above ground level and located to allow incremental installation, if required. Services to and from the process equipment (e.g. power, communications, and raw feed water (seawater)) would comprise a mix of buried and overhead methods. The general components of the water treatment process would comprise:
  - *Pre-treatment:* a pre-treatment system is required to remove micro-organisms, sediment, and organic material from the raw feed water.
  - *Desalination*: a reverse osmosis (RO) desalination system made up of pressurising pumps and membranes. These would be comprised of modular components. In addition, a number of tanks and internal pipework would be required.
  - *Post treatment:* desalinated water would be treated to drinking water standards and stored prior to pumping to the potable water supply network.
- **Brine disposal system** – The desalination process would produce up to 56 ML/day of wastewater, comprising predominantly brine, as well as a small amount of pre-treatment and RO membrane cleaning waste. The waste brine from the desalination process would be transferred via a pipeline to a brine pump station at the Belmont WWTW for disposal via the existing ocean outfall pipe.
- **Power supply** – Power requirements of the amended water treatment process plant would require connection to Ausgrid’s 33 kV line to the north-west of the water treatment process plant site, with new private power line connecting to a substation within the plant site.
- **Ancillary facilities** – Including a tank farm, equipment housing buildings, chemical storage and dosing, hardstand areas, stormwater and cross drainage, access roads, parking areas, and fencing, signage and lighting.

1.3 Objectives

The objectives of the DSI were to:

- Assess the type, extent and level of contamination at the Site.
- Assess the potential risk to human health and/or the environment as a result of past and/or present activities at the site.
- Provide recommendations as to the requirement for remediation and/or management of contaminated soils (if present).
- Provide an indicative in-situ waste classification for soils that may require disposal off-site.

1.4 Scope of work

The scope of works for the DSI included the following:

- Site history review including review of previous soil and groundwater assessment reports covering the Site.
- Review of geology, hydrology and topography information.
- Review of NSW Environment Protection Authority (EPA) records of notices and sites notified to the EPA under the *Contaminated Land Management Act* 1997 (CLM Act) and *Protection of the Environment Operations* (POEO) Environment Protection Licence (EPL) Register.
- Undertake a site inspection of the Site to assess the current conditions and identify any areas of potential contamination concern.
- Review of dial before you dig plans to identify potential locations of underground services and on-site clearance of the selected locations by an underground service location contractor.
- Excavation of twelve (12) hand augers (BH401 to BH412) to a maximum depth of 1 m below ground level (mbgl) within the northern extent of the proposed location of the desalination plant and intake design (around the current WWTW).
- Laboratory analysis of selected soil samples from each location for total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene, xylenes and naphthalene (BTEXN), polycyclic aromatic hydrocarbons (PAH), organochlorine pesticides (OCP), polychlorinated biphenyl (PCB), heavy metals (As, Cd, Cr, Cu, Pb, Ni, Zn and Hg) and asbestos in soil.
- Preparation of a report with reference to NSW EPA 2020 *Contaminated Land Guidelines. Consultants Reporting on Contaminated Land* summarising the results of the investigation and recommendations for further investigations or remediation (if required).

1.5 Limitation of investigations

Historical land titles and Council information (Section 10.7 certificates or register of development or building applications) were not reviewed as part of the desktop study. This DSI was limited to investigation of soils only and did not include investigation of groundwater. Soil sampling locations were limited to the desalination plant and intake area only and discussion is provided regarding soil analytical results from within this area from the current investigation and two previous investigations. It is noted that sampling within the southern extent of the Site cannot be completed until after approval of the Project. The presence of potentially intact A horizon soils, identified in the Aboriginal Cultural Heritage Assessment as having the potential to contain Aboriginal cultural materials, requires that an Aboriginal Cultural Heritage Management Plan (ACHMP) be in place prior to any works in this area. Investigation of this area will be undertaken following approval of the ACHMP and prior to construction.

2. Site information

2.1 Site location and description

The Site details are summarised below in Table 2-1.

Table 2-1 Site identification summary

Information	Details
Site owner	Hunter Water Corporation
Site address	Ocean Park Road, Belmont NSW
Current Lot and DP	Lot 1 DP 433549
Local Government Authority	Lake Macquarie City Council
Parish	Kahibah
County	Northumberland
Current zoning	SP2 Infrastructure
Current land use	Wastewater treatment works and vacant land
Proposed land use	Drought response desalination plant and intake
Site elevation (m AHD)	The Site is generally flat ranging from approximately 2 m AHD inside the former evaporation ponds and approximately 7 m AHD with a slope towards the eastern portion of the Belmont WWTW.
Site area (total)	Approximately 15.2 hectares.
Surrounding land use	North: Belmont WWTW. South: undeveloped sand dunes and dune vegetation. West: Ocean Park Road, followed by Belmont Lagoon and residential properties. East: Sand dunes, beach sands and the Pacific Ocean.
Site description	The Site lies directly to the south and east of the existing Belmont WWTW and includes two disused WWTW evaporation ponds. The Pacific Ocean is located approximately 250 m to the east and Belmont Lagoon is located approximately 350 m to the west of the Site. Development in the area comprises Ocean Park Road, an unnamed access road, the Belmont WWTW and associated infrastructure and a 33 kV Ausgrid power transmission line. Vegetation across the Site comprised Bitou bush, exotic grasses and native vegetation. Minor wetland/swamp type vegetation exists in the centre of the more western disused evaporation pond. Topographically the Site lies in a relatively low lying flat area. The surface has been modified to form the embankments of the disused evaporation ponds, which vary in height and are estimated to be in the order of 1.5 m - 3.0 m. To the north the Belmont WWTW lies on top of a low rise and to the east are undulating sand dunes. Within the Belmont WWTW it was noted that a spoil storage area and associated hardstand exist to the south-west. To the east wastewater treatment infrastructure exists adjacent the proposed water intake structure. An 11 kV Ausgrid underground electrical cable runs north-south along the eastern boundary line. A photograph log is presented in Appendix H.

3. Desktop investigation

3.1 Environmental setting

The following section provides an overview of the environmental setting of the Site as provided in GHD 2019 *Belmont Drought Response Desalination Plant. Contamination Assessment Report*.

Table 3-1 Site environmental setting

Information	Details
Geology and soils	The Site is underlain by medium to fine grained dune and marine sand, disturbed by fill and excavation works related to the construction of the Belmont WWTW. Reference to the soil landscape map identified the following soil landscapes within the Site: • Tuggerah (tg) landscape: Local relief is up to 20 m and slope gradients are in the range of 5% to 45%. Soils include loose sands and are covered with heathland vegetation. Possible limitations include wind erosion hazard, high permeability soils, localized flooding, high water table, strongly acid soil in places and the landscape coincides with a mine subsidence district. • Belmont Swamp (bs) landscape (west of the Site around Belmont Lagoon: comprises level to very gently undulating coastal swamps including shallow lakes and very shallow water tables. Dominant soil materials consist of organic topsoils underlain by saturated fine to coarse grained sands. • Narrabeen (na) landscape: Beaches and coastal foredunes on marine sands, with relief of up to 20 m and slopes of less than 3 %. Soils comprise loose, medium to coarse grained sands. Possible limitations include severe wave erosion hazard, severe wind erosion hazard, extreme foundation hazard, non-cohesive highly permeable strongly alkaline saline soils of very low fertility.
Acid sulfate soils	Reference to the ASS risk maps indicates the south west portion of the Site is located in an area with a high probability of occurrence of ASS and the north eastern portion of the Site is mapped as having a low probability of occurrence of ASS Beach areas within the east of the Site are mapped as having a low probability and/or 'no known occurrence' ASS risk.
Hydrogeology	An examination of the online WaterNSW register identified 23 registered groundwater bores within 2 km of the site (https://realtimedata.waternsw.com.au/). Review of the Australian Groundwater Explorer (BoM, 2018) identified 41 bores within 2 km of the site, with only 17 listed as functional. Water uses were recorded as irrigation supply and unknown purposes. Bore depths are no greater than 7 mbgl. Groundwater within the Site would be expected to vary between 1 m and 6 m bgl and flow east towards the Pacific Ocean. Based on the shallow depth to groundwater there is a potential for groundwater within the surrounding area to be used for either drinking water, recreational or irrigation purposes.

3.2 Previous investigations

A number of previous investigations have been conducted within and surrounding the Site. The following section provides a summary of the review of these reports.

Table 3-2 Summary of previous reports

Previous report	Summary
RCA, 2002, Upgrade of Belmont WWTW.	The investigation comprised the drilling of three boreholes to depths of approximately 8 m with installation of groundwater piezometers. The report includes a summary of results from a previous RCA investigation performed in 1999 that comprised two boreholes drilled to a depth of up to 6 m and a J&K (1994) geotechnical investigation that included four boreholes of unknown depth. The results of the investigations indicated the site is underlain by: • Fill, generally comprising sand with variable quantities of gravel to depths of up to 4.7 m; overlying • Natural sand, fine to medium grained, medium dense or better, to greater than 8 m depth Groundwater was encountered in the boreholes at depths ranging from 4.3 m to 5.6 m, approximately 0.5 m AHD. Laboratory testing indicated the sands were not actual or potential ASS. No contamination testing was undertaken.
SKM, 2012, Spoil Investigation Report.	The investigation comprised 18 test pits, four grab samples and four boreholes installed as monitoring wells to assess contaminants present in fill materials and the disused evaporation ponds adjacent to the WWTW. Depth of investigations ranged between 0.2 m to 5 m. Results indicated the site is underlain by fill, generally comprising sand with variable quantities of gravel and concrete with some brick, terracotta pipes and bitumen/asphalt to depths of up to 2.4 m overlying fine to medium grained sand. Soil analytical results were assessed against the former NEPM 1999 health investigation levels (HIL) commercial/industrial land use (HIL F). Results were reported above the HIL F for benzo(a)pyrene in SP10.1 and SP20.1. Comparison of the concentrations against the current NEPM 2013 reported concentrations below HIL D[1]. Elevated benzo(a)pyrene in these materials was attributed asphalt in the fill materials sampled. No asbestos was identified in any sample analysed. Two sediment samples (from the sludge ponds) reported elevated ammonia and total nitrogen. One sample (SED 2) recorded concentrations of total coliforms equal to the laboratory limit of reporting (LOR). It was concluded that the risks posed to human health and the environment by the deposited fill material was low. Sediment samples indicated that the western most sludge pond contained elevated concentrations of phosphorous, ammonia and nitrogen. Microbial results indicate that minimal coliforms are present in the ponds. Groundwater levels were noted to be in the range of 1.025 m to 2.68 m below the top of the cap. Groundwater analytical results indicated: • Elevated copper in MW3 and MW4 and zinc in MW2, marginally above ANZECC 2000 guidelines but below the NEPM 1999. Not considered to warrant further investigation. • Elevated nickel in up-gradient location MW1. Considered indicative of a background level. • Elevated ammonia in MW2 possibly from waste on the adjoining council land. • Elevated nitrogen at all locations.

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[1] Further explanation of the relevant HILs are provided in Section 7.3.

Previous report	Summary
	- Elevated phosphorous in all locations with MW4 significantly higher which may correlate with elevated phosphorous in SED 1. - Slightly elevated TPH concentrations in MW3 considered to originate from the fill material on site.
AECOM, 2017a, Temporary Desalination Project Readiness Activities Stage 1 Belmont Conceptual Hydrogeological Model	This report presented an interpreted hydrogeology model of the site, comprising an unconfined aquifer within the Quaternary aged sands, which confines the underlying aquifer within the Permian aged sandstone (bedrock). The report found the water table to lie within the sand unit at approximately 4 m below ground level (mbgl). Groundwater flow was expected to be to the east, the degree of which was unknown. Localised westward flow may occur proximal to connected surface waters such as Belmont Lagoon. The thickness of the aquifer ranged from 15 m to 40 m, however, is expected to thin significantly towards the coast
AECOM, 2017b, Phase 1 Site Contamination Review. Potential Temporary Desalination Site, Belmont.	Key information from this Phase investigation included: - The neighbouring operational WWTW has reported concentrations of nutrients and heavy metals above adopted groundwater criteria and concentrations of microbiological analysis above the LOR which may present potential contamination links to the site (SKM, 2012). - Filling and waste material stockpiles adjacent to the site as shown on the 2004 aerial photograph (and confirmed during the inspection) may present potential sources of contamination. - The land has been identified to contain potential Unexploded Ordinance (UXO) which may impact the site. - Potential filling was evident on and surrounding the site. - Potential historical infrastructure associated with pipework connections to the old sludge ponds are reported to exist. - Hunter Water maintenance construction compound was located to the west of the site and was established in 2006. During the inspection this area had large stockpiles of spoil labelled as contaminated waste and waste with tar. The surface of the compound appeared to be unsealed compacted gravel, no fuel or chemical storage or infrastructure was observed in this area. Overall, AECOM considered that there was a moderate risk of potential contamination associated with the site that may present an unacceptable risk to human health and/or the environment. AECOM recommended a UXO survey of the site and a more detailed contamination assessment to identify the need for remediation or management measures to mitigate unacceptable contamination risks to make the site suitable for the proposed construction and use of the temporary desalination plant.
AECOM, 2017c, Preliminary Environmental Assessment, Lower Hunter Water Plan: Temporary Desalination Project.	This report details the findings of an environmental risk screening undertaken for the desalination plant project, including potential impacts on the surrounding natural and built environment and the potential concerns of the local community and stakeholders. AECOM 2017b (summarised above) identified contamination sources including the WWTW (with previously reported elevated concentrations of nutrients, heavy metals and microbials), filling and waste material stockpiles as well as redundant evaporation pond infrastructure and potential asbestos/contaminated materials associated with possible remaining subsurface pipework. The report identified key environmental concerns associated with the construction phase, which comprised: - Erosion and sedimentation of nearby watercourses. - Accidental spillages of chemicals/fuel by construction plant and equipment. - The potential for wind erosion from unsecured stockpiles created during construction.

Previous report	Summary
	• Disturbance of contaminated soils on-site, if present. It was anticipated that these impacts could be appropriately managed and mitigated in accordance with general construction management measures.
GHD 2019 Belmont Drought Response Desalination Plant. Contamination Assessment Report. GHD. November 2019.	This report detailed the results of a contamination assessment prepared to inform the Environmental Impact Statement (EIS) with regard to the potential contamination issues within the desalination plant and intake structures as well as water connections and to provide recommendations for management and/or remediation measures to be implemented during construction. The scope of work included the following: • Site history review including review of any available existing information including previous soil and groundwater assessment reports, former military uses etc. • A desk top review of geology, hydrology and topography information, a review of NSW EPA information, review of the NSW Office of Water groundwater database and • A general inspection of the proposal area to identify areas of potential contamination concern. • Collection of targeted soil samples from boreholes and test pits completed as part of the geotechnical investigations including six test pit locations (TP101 to TP106) and five borehole locations (BH101 to BH104 and BH108) from the desalination plant footprint and intake structure. Ten borehole locations (BH301 to BH306 and BHA301 to BHA304) were also targeted to the proposed water connection routes but discussion of the results does not form part of this assessment. • Laboratory analysis of selected soil samples from each location for TRH, BTEXN, PAHs, OCPS, PCBs, heavy metals (As, Cd, Cr, Cu, Pb, Ni, Zn and Hg), pH, cation exchange capacity (CEC) and asbestos. The desktop review identified that a potential exists for contamination to be present in the following areas of the site: • Fill material and potentially contaminated soils within the footprint of the former WWTW (sludge ponds) and Hunter Water compounds. • Existing bitumen and road base. • Historical use of herbicides and pesticides. • Illegal dumping of waste along the access tracks, trails and road corridor. • Other commercial/industrial properties that may store oils, fuels, grease, herbicides and pesticides. The typical subsurface profile encountered across the EIS Project Area comprised varying depths of fill over alluvial sands. Groundwater was encountered in all but two of the test locations (TP101 and TP106). Water levels were logged at the desalination plant site between 0.95 mbgl (BH101) to 4.1 mbgl (BH105). Soil samples reported contaminants below both HIL C and HIL D for all samples. A potential ACM fragment was noted on the surface between TP106 and GW103 (within the temporary desalination plant site), with additional smaller fragments noted near GW108 (70 m west of the temporary desalination plant site, outside of the construction footprint). These fragments were bonded and given that there were no fibres identified in soils, these are considered to be a low risk to workers. The results of the soil investigation indicated that soils within the proposed area are unlikely to present a significant health risk to workers during construction works and future site users post construction. The risk of exposure from any isolated contaminated areas or unexpected finds can be managed during construction with a Contaminated Soil Management Plan (CSMP).

Previous report	Summary
	Concentrations of copper, zinc, TRH and benzo(a)pyrene were reported above the recreational open space and commercial/industrial ecological investigation levels (EILs) and ecological screening levels (ESLs)[2] in five locations across the area investigated. The concentrations of contaminants are most likely attributable to the presence of fill materials and proximity of the samples to either the former WWTW evaporation ponds or adjacent tracks. The elevated levels of these contaminants could present a potential environmental risk to nearby sensitive receptors such as bushland and waterways if not managed appropriately during construction. Based on the investigations undertaken to date and taking into account the proposed future land use (desalination plant and associated service corridors), the site was considered suitable from a contamination perspective for redevelopment. As no significant human health or environmental risks to construction workers or future site users have been identified, no remediation within the site was proposed. Soils were generally classified as General Solid Waste, with the exception of soils at TP106 and BHA304 which are currently classified as Restricted Solid Waste. These classifications could be reduced with further sampling and TCLP analysis. In addition, soils where either asbestos fragments or acid sulfate soils were identified would also be classified as either asbestos waste or acid sulfate soil waste. It is noted that these classifications were preliminary only and further sampling and analysis would be required prior to disposal off site.
GHD 2020, Belmont Drought Response Desalination Plant D&C, Supplementary Geotechnical and Contamination Assessment for Onshore Plant Layout, GHD 2020.	GHD completed supplementary geotechnical and contamination investigations for the proposed seawater pump station and the amended design footprint. Works included hand auger and test pit excavations at eight locations (HA201, TP202 to TP208). Two locations TP203 and TP204 were located within the Site. Sample locations are presented in Figure 3, Appendix A. Selected samples were analysed from each location for TRH, BTEXN, PAHs, OCPs, PCBs, heavy metals (As, Cd, Cr, Cu, Pb, Ni, Zn and Hg), pH, cation exchange capacity (CEC) and asbestos. One sample was analysed for Per- and Polyfluoroalkyl Substances (PFAS). No visual or olfactory signs of contamination were noted during the investigation. No potential asbestos containing materials (ACM) were noted. Each contamination sample was screened for volatile organic compounds (VOCs) using a photo-ionisation detector (PID). All results were below 2 ppm. Samples were compared to the NEPM 2013 HIL/HSL and EIL/ESL[3] for commercial/industrial land use. All soil samples reported concentrations below the adopted health assessment criteria. Chrysotile asbestos was detected in the form of a loose fibre bundle in one soil sample analysed from TP204 0-0.1. Three samples (TP202 0-0.1, TP203 0-0.1, TP204 0-0.1) reported copper concentrations above the EILs, while zinc was reported above the EILs for TP202 0-0.1 and TP204 0-0.1. Based on the results, soils were generally classified as general solid waste with the exception of soils at TP202 0-0.1 which would be classified as restricted solid waste (based on a lead concentration) and TP204 0-0.1 which would be classified as restricted solid waste with asbestos (based on a lead concentration and asbestos).

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[2]

[3] Further explanation of the relevant EILs/ESLs are provided in Section 7.4.

Previous report	Summary
	The report recommended further investigations be undertaken in the area of TP204 to assess the extent of asbestos impacts and potential risks to workers during construction. The report concluded that although there were levels of contaminants above the EILs, based on the proposed future use as a desalination plant and limited ecological amenity, it was considered unlikely these contaminants would present a significant risk to the environment in this area. It was also recommended that a contaminated soils management plan (CSMP) be prepared prior to construction to manage potential risks from disturbance and exposure of potential contamination within the site during construction.

3.3 NSW Environment Protection Authority

The following section provides an overview of the NSW EPA database searches in the surrounding area.

Table 3-3 Summary of NSW EPA data set searches

Information	Details
Contaminated land record of notices	Former Mobil Service Station (now 7-Eleven), Marks Point – 1.5 km SW of the Site - Agreed voluntary remediation proposal, (2003 and 2007), Site Audit Statement (2015), Notice of completion or withdrawal of VMP (2015), Amendment of repeal of order or notice (2015).
List of NSW contaminated sites notified to EPA	Coles Express Belmont - 502 Pacific Highway - 1.75 km NW Former Ampol Service Station, Belmont - 467-469 Pacific Highway - 2.25 km N Belmont Bus Depot, north Belmont - 2 Floraville Road - 2.75 km N Caltex, Belmont North - 406 Pacific Highway - 2.75 km N Woolworths Service station, Belmont North - 399 Pacific Highway - 2.75 km N Former Mobil Aviation Depot, Belmont Airport, Marks Point - 864 Pacific Highway - 2.75 km S Former Mobil Service Station (now 7-Eleven), Marks Point - 770-772 Pacific Highway - 1.75 km S
POEO licence register	Hunter and New England Area Health Service, Croudace Road, Belmont - Hospital – 3.2 km NW Hunter Water Corporation - Off Ocean Park Road, Belmont - WWTW – north of Site. Lake Macquarie Yacht Club - 1 Ada Street, Belmont - Boat mooring and storage - 1.4 km NW Marks Point Marina - Edith Street, Marks Point - Boat construction and maintenance - 2.3 km SW

Based on the results, the only site that is likely to affect the proposed development is the adjoining WWTW site. Due to the distance away from the Site, the remaining sites are unlikely to affect the proposed development.

3.4 Historical aerial photographs

A review of available historical aerial photographs (1965, 1975, 1983, 1987, 1990 and 1996) was completed for the Site. The aerial photographs show that the majority of the southern portion of the Site has remained undeveloped sand dunes with varying degree of vegetation since 1965. The northern portion of the Site appeared to have been used as evaporation ponds from around 1990 till sometime after 1996 (limit of aerial review). The aerial photographs are presented in Appendix B.

4. Preliminary conceptual site model

Based on the available information detailed above, the following preliminary contamination conceptual site model (CSM) has been developed for the potential sources of contamination (on-site) that may have, or may be able to, impact upon the Site. This preliminary CSM was developed to assist with the development of the scope of works for the DSI.

4.1 Potential contamination sources

Table 4-1 summarises the potential areas of environmental concern based on the results of the desktop review and site inspection.

Table 4-1 Potential contaminants of concern

Source	Description	Potential Contaminants of Concern
Placement of fill	Placement of fill in the footprint of the former WWTW evaporation ponds.	Heavy metals, PAH, TPH, BTEX, phenols, asbestos, nutrient and microbial
Evaporation ponds	Sludge from former WWTW operations	Heavy metals, PAH, TPH, BTEX, phenols, asbestos, nutrient and microbial
Spillage or leakage of oils, fuels	Spills and leaks associated with equipment and machinery historically used on the WWTW site.	Heavy metals, PAH, TRH, BTEXN, PCBs
Waste stored within Hunter Water compound	Potentially contaminated waste soils (tar etc.)	Heavy metals, PAH, TRH, BTEXN, Phenols, asbestos
Subsurface infrastructure potentially beneath the site	Subsurface infrastructure (pipes, conduit) potentially containing sludge residues or asbestos	Heavy metals, PAH, TPH, BTEX, phenols and asbestos
Illegal Dumping	Asbestos containing materials (ACM) may be present as a result of illegal dumpling	Asbestos, heavy metals, PAH, TRH, BTEXN, OCPs, OPPs and PCBs

4.2 Pathways

4.2.1 Migration pathways

The following migration pathways were identified for the Site:

- Vertical and horizontal migration of surface water and sediment
- Vertical and horizontal migration of groundwater
- Windborne dust

4.2.2 Exposure (contaminant uptake) pathways

Based on the identified receptors and the release, fate, and transport characteristics of the chemicals of potential concern, pathways through which receptors may become exposed include inhalation, ingestion and dermal absorption. These are discussed briefly below in the context of the site setting:

- Inhalation Exposure Pathway: There is the potential for creation of dust from unsealed surfaces and filled areas of the site. Risk of potential inhalation of asbestos fibres contaminated dusts. Soil or groundwater vapour inhalation is also possible but unlikely.
- Ingestion Exposure Pathway: Ingestion of contaminants by current and future site workers through construction and/or maintenance activities which may involve direct contact with contaminated soils or groundwater.
- Dermal Exposure Pathway: Exposure may occur via sorption through biological membranes such as skin. This pathway may be a concern whenever contaminated soil, groundwater comes into direct contact with a biological membrane. This pathway could also be a concern if contaminated surface water (runoff from the sites) was to come into direct contact with benthic and aquatic flora and fauna within off-site surface-water receiving environments.

4.3 Receptors

The following potential sensitive human and environmental receptors of contamination were identified for the site and surrounding areas:

- Human health receptors:
  - Site workers or visitors (e.g. workers, subcontractors and members of public).
  - Off-site receptors (users of surrounding water bodies, beach areas or walking tracks for recreational purposes).
  - Current and future occupants of surrounding properties.
- Environmental receptors
  - Flora and fauna within the proposal area and surrounding land.
  - Local drainage channels and surface water.
  - Groundwater beneath the study area.
  - Off-site ecosystems.

5. Sampling and analysis plan and methodology

5.1 Summary of field activities

Field investigations have been undertaken within the Site between 31 July 2018 and 9 September 2020. A summary of the activities undertaken during this time is presented below. Sample locations are presented in Figure 3, Appendix A.

Table 5-1 Field investigation program

Date	Activity
31 July 2018	Drilling and sampling BH104 (GHD 2019).
17 August 2018	Drilling and sampling BH102 and BH103 (GHD 2019).
22 August 2018	Drilling and sampling BH108 (GHD 2019).
29 August 2018	Drilling of BH101 (GHD 2019).
6 September 2018	Excavation and sampling from test pits TP101 to TP106 (GHD 2019)
10 June 2020	Excavation and sampling from test pits TP202 to TP208 and hand auguring of HA201 (GHD 2020).
8 and 9 September 2020	Hand auguring and sampling of boreholes BH401 to BH412 as part of this current investigation.

5.2 Sampling and analytical program

Soil samples have been collected during geotechnical and environmental investigations to assess the potential for soil contamination within the Site. Samples locations within the Site comprised both grid spaced and targeted locations selected based on the findings of the desktop review (Section 3) and field observations.

The analytical program is summarised in Table 5-2. The investigation locations are presented in Figure 3, Appendix A.

Table 5-2 Investigation locations, sampling and analytical program

Location	Total Depth (m)	Investigation Method	Soil Samples Analysed (mbgl)	Analytical Parameters
Investigation location 31/07/2018				
BH104	20.0	Borehole	BH104_0.0-0.2 BH104_0.2-0.3	Asbestos, Heavy metals, TRH, BTEXN, PAH Heavy metals, TRH, BTEXN, PAH
Investigation locations 17/08/2018				
BH102	22.0	Borehole	BH102_0.0-0.2 BH102_0.5-0.6	Heavy metals, TRH, BTEXN, PAH Heavy metals, TRH, BTEXN, PAH
BH103	41.1	Borehole	BH103_0.0-0.2 BH103_0.5-0.6	Asbestos, Heavy metals, TRH, BTEXN, PAH Heavy metals, TRH, BTEXN, PAH
Investigation location 22/08/2018				
BH108	20.5	Borehole	BH108_0.0-0.2	Asbestos
Investigation locations 29/08/2018				
BH101	20.0	Borehole	BH101_0.0-0.2 BH101_0.45-0.5	Asbestos, Heavy metals, TRH, BTEXN, PAH Heavy metals, TRH, BTEXN, PAH
Investigation locations - Composite samples (31/07/2018 to 29/08/2018)				
COMP1	-	-	BH102_0.0-0.2 and BH103_0.0-0.2	OCP, PCBs
COMP2	-	-	BH101_0.0-0.2 and BH104_0.0-0.2	OCP, PCBs
Investigation locations 06/09/2018				
TP101	2.0	Test pit	TP101_0.0-0.2 TP101_0.5-0.6	pH, CEC, Heavy metals, TRH, BTEXN, PAH pH, CEC
TP102	2.0	Test pit	TP102_0.0-0.2	Heavy metals, TRH, BTEXN, PAH
TP103	1.9	Test pit	TP103_0.0-0.2 TP103_0.5_0.6 TP103_1.0-1.1	Heavy metals, TRH, BTEXN, PAH pH pH
TP104	2.2	Test pit	TP104_0.0-0.2	Heavy metals, TRH, BTEXN, PAH
TP105	1.6	Test pit	TP105_0.0-0.2 TP105_0.6-0.7	pH, CEC, Heavy metals, TRH, BTEXN, PAH pH, CEC
TP106	1.8	Test pit	TP06_0.0-0.2 (FD20)	Asbestos, Heavy metals, TRH, BTEXN, PAH

Location	Total Depth (m)	Investigation Method	Soil Samples Analysed (mbgl)	Analytical Parameters
Investigation locations 10/06/2020				
HA201	0.4	Borehole	HA201_0.0-0.1 HA201_0.2-0.3	Asbestos, Heavy metals, TRH, BTEXN, PAH Heavy metals, TRH, BTEXN, PAH
TP202	1.1	Test pit	TP202_0.0-0.1 TP202_0.2-0.3	Asbestos, Heavy metals, TRH, BTEXN, PAH Heavy metals, TRH, BTEXN, PAH
TP203	1.3	Test pit	TP203_0.0-0.1 TP203_0.2-0.3	Asbestos, Heavy metals, TRH, BTEXN, PAH Heavy metals, TRH, BTEXN, PAH
TP204	1.6	Test pit	TP204_0.0-0.1 TP204_0.2-0.3	Asbestos, Heavy metals, TRH, BTEXN, PAH Asbestos, Heavy metals, TRH, BTEXN, PAH
TP205	1.6	Test pit	TP205_0.0-0.1 TP205_0.5-0.6 (FD01)	Asbestos, Heavy metals, TRH, BTEXN, PAH Asbestos, Heavy metals, TRH, BTEXN, PAH
TP206	1.6	Test pit	TP206_0.0-0.1 TP206_0.5-0.6	Asbestos, Heavy metals, TRH, BTEXN, PAH Heavy metals, TRH, BTEXN, PAH
TP207	0.3	Test pit	TP207_0.0-0.1 TP207_0.2-0.3	Asbestos, Heavy metals, TRH, BTEXN, PAH Heavy metals, TRH, BTEXN, PAH, PFAS
TP208	1.1	Test pit	TP208_0.0-0.1 (FD05) TP208_0.2-0.3	Asbestos, Heavy metals, TRH, BTEXN, PAH Heavy metals, TRH, BTEXN, PAH
COMP1			TP203_0.0-0.1, TP204-0.0-0.1, TP205_0.0-0.1	OCP, PCBs
COMP2			TP206_0.0-0.1, TP207_0.0-0.1, TP208_0.2-0.3	OCP, PCBs
COMP3			HA201_0.2-0.3, TP202_0.2-0.3, TP206_0.2-0.3	OCP, PCBs
COMP4			TP203_0.5-0.6, TP204_0.5-0.6, TP203_0.5-0.5	OCP, PCBs
Investigation locations 8-9/09/2020				
BH401	1.1	Borehole	BH401_0.2-0.3 BH401_0.5-0.6	Asbestos, Heavy metals, TRH, BTEXN, PAH Heavy metals
BH402	1.1	Borehole	BH402_0.2-0.3 BH402_0.5-0.6	Asbestos, Heavy metals, TRH, BTEXN, PAH Heavy metals
BH403	1.1	Borehole	BH403_0.2-0.3 BH403_0.5-0.6	Asbestos, Heavy metals, Heavy metals

Location	Total Depth (m)	Investigation Method	Soil Samples Analysed (mbgl)	Analytical Parameters
BH404	1.1	Borehole	BH404_0.2-0.3 BH404_0.5-0.6	Asbestos, Heavy metals, TRH, BTEXN, PAH Heavy metals
BH405	0.8	Borehole	BH405_0.2-0.3 BH405_0.7-0.8	Asbestos, Heavy metals Heavy metals
BH406	1.1	Borehole	BH406_0.2-0.3 (FD03) BH406_0.5-0.6	Asbestos, Heavy metals, TRH, BTEXN, PAH Heavy metals Heavy metals
BH407	1.1	Borehole	BH407_0.2-0.3 (FD04) BH407_0.5-0.6 BH407_1.0-1.1	Asbestos, Heavy metals, TRH, BTEXN, PAH Heavy metals TRH, BTEXN, PAH Heavy metals
BH408	1.1	Borehole	BH408_0.2-0.3 BH408_0.5-0.6	Asbestos, Heavy metals Heavy metals
BH409	1.1	Borehole	BH409_0.2-0.3 BH409_1.0-1.1	Asbestos, Heavy metals Heavy metals
BH410	1.1	Borehole	BH410_0.2-0.3 BH410_0.5-0.6	Asbestos, Heavy metals, TRH, BTEXN, PAH Heavy metals
BH411	1.1	Borehole	BH411_0.2-0.3 BH411_1.0-1.1	Asbestos, Heavy metals Heavy metals
BH412	1.1	Borehole	BH412_0.2-0.3 BH412_1.0-1.1	Asbestos, Heavy metals, TRH, BTEXN,PAH Heavy metals
COMP1			BH401_0.2-0.3, BH402_0.2-0.3, BH403_0.2-0.3	OCP, PCBs
COMP2			BH405_0.2-0.3, BH406_0.2-0.3, BH407_0.2-0.3, BH408_0.2-0.3	OCP, PCBs
COMP3			BH409_0.2-0.3, BH410_0.2-0.3, BH411_0.2-0.3, BH412_0.2-0.3	OCP, PCBs
COMP4			BH402_0.5-0.6, BH405_0.7-0.8, BH409_0.5-0.6, BH412_0.5-0.6	OCP, PCBs

Metals included As, Cd, Cr, Cu, Hg, Pb, Ni, and Zn

TRH – Total recoverable hydrocarbons

BTEXN – Benzene, toluene, ethylbenzene, xylenes and naphthalene

PAH – Polycyclic aromatic hydrocarbons

OCP – Organochlorine pesticides

PCB – Polychlorinated biphenyl

PFAS – Per- and Polyfluoroalkyl Substances

5.3 Soil sampling methodology

Soil investigations were undertaken by GHD Geotechnical and Environmental Engineers. All works were undertaken in accordance with GHD's written Standard Field Operating Procedures.

A summary of the sampling and analysis works completed as part of this DSI are provided in Table 5-3. The summary relates to the investigations conducted between July 2018 and September 2020.

Table 5-3 Soil sampling methodology

Item	Description
Date of fieldwork	31 July, 17, 22, 29 August, 6 September 2018 10 June and 8 - 9 September 2020
Work clearance	JSEA including daily pre-work assessment and hazard identification
Technical guideline	Department of Sustainable Natural Resources *Soil Survey Standard Test Method Unified Soil Classification System: Field Method* NSW EPA (1995), *Sampling Design Guidelines.*
Ground clearance	Prior to intrusive works, underground service plans from Dial Before You Dig (DBYD) were obtained to identify the approximate location of underground services. An accredited and qualified underground service locator was used to clear each sampling location and areas within the immediate vicinity of each location using underground service detection equipment.
Bore logging	All field observations and subsurface conditions were recorded on lithological logs (Appendix C) in accordance with the *Unified Soil Classification System: Field Method*.
Soil sampling	Test pits and boreholes were excavated using either an excavator, truck mounted drill rig or hand auger. Soil samples were generally collected at the surface, 0.3 m below ground level (mbgl), 0.5 mbgl and at 0.5 m intervals thereafter. Samples were collected from significant soil horizons encountered including fill materials and underlying natural materials and other strata which exhibited unusual characteristics. Samples were collected either directly from the auger or from the excavator bucket, ensuring the soils were not in direct contact with the metal. Samples were collected using new, disposable nitrile gloves to limit cross contamination between sampling locations.
Sample handling and transport	Samples were placed in unpreserved laboratory supplied snap lock bags (asbestos testing) and glass jars (soil contamination testing) and stored in an ice filled cooler for sample preservation prior to and during shipment to the testing laboratory. All sample jars and bags were clearly labelled with a sample number, sample location, sample depth, and sample date. All samples were transported under signed Chain of Custody documentation to ALS Environmental and Eurofins (independent and National Association of Testing Authorities Australia (NATA) accredited laboratory) for the analysis requested.
Quality assurance and quality control (QA/Q)	Duplicate analysis samples sets (split and field duplicates) were also collected and analysed at a general rate of 1 in 10 samples for QA/QC purposes. No trip spikes, trip blanks or rinsate samples were prepared or analysed.

6. Quality assurance/quality control

6.1 Data quality objectives

The purpose of establishing data quality objectives is to ensure the field investigations and analyses are undertaken in a way that enables the collection and reporting of reliable data on which to base the assessment. The data quality objectives and the procedures designed to achieve these objectives are listed in Table 6-1 below.

Table 6-1 Data quality objective decision process

Process	Response
Step 1. Define the problem that necessitates the study.	The proposed drought response desalination plant lies adjacent to a WWTW and partially over former evaporation ponds and has been subject to historical placement of fill. As a result, the proposed construction work has a potential to disturb contaminated soils. The presence of contamination impacts within the study area is currently unknown. Hunter Water need to understand the potential risks to workers and environment that may be caused through the disturbance of contaminated soils.
Step 2. Identify the Goal of the Study. State how environmental data will be used in meeting objectives and solving the problem, identify study questions, define alternative outcomes.	The objectives of the investigations were to: • Understand the potential contamination issues within the Site. • Provide recommendations for management and/or remediation to be implemented during construction.
Step 3. Identify Information Inputs. Identify data and information needed to answer study questions.	Data inputs for the proposal include: • Previous investigations undertaken. • Desktop review of available information regarding the Site. • Soil sampling undertaken as part of this investigation.
Step 4. Define the Boundaries of the Study. Specify the target population and characteristics of interest, define spatial and temporal limits, scale of inference.	The spatial boundaries of the works are defined by those described in Section 2 and 3 and shown in Figure 1 and 2, Appendix A.
Step 5. Develop the Analytic Approach. Define the parameters of interest, specify the type of inference, and develop the logic for drawing conclusions from findings.	Reviews of historical site information and previous assessments as outlined in Section 3 have been used to identify the major contaminants of concern. Results reported as part of this investigation and previous investigation will be used to better characterise the areas of concern.
Step 6. Specify Performance or Acceptance Criteria. Develop performance criteria for new data being collected or acceptable criteria for existing data being considered for use.	The guidelines as listed in Section 7 will be used to assess the contamination status of the soils and groundwater within the study area. Data Quality Indicators as described in Section 6.2 will be used to evaluate the acceptability of the data.
Step 7. Develop the Plan for Obtaining Data. Select the resource-effective sampling and analysis plan that meets the performance criteria.	Samples were collected as per Section 5 from geotechnical boreholes/ test pits. QA/QC procedures were used and QC samples collected to allow evaluation of Data Quality Indicators as described in Section 6.2.

6.2 Data Quality Indicators

GHD has selected the following Data Quality Indicators to ensure that the data is of a quality from which to draw conclusions:

- Data Representativeness – is the data representative of site conditions?
- Data Completeness – are there comprehensive records available from all field work undertaken, and have all areas of concern been sampled and analysed?
- Data Comparability – is the quality of the data such that samples analysed at different times can be compared, and is data consistent with field observations?
- Precision and Accuracy for Sampling and Analysis – does the laboratory achieve the relevant Quality Control Criteria?

6.3 QA/QC results

The methodology, results and discussion of the Quality assurance/Quality Control program are presented in Appendix D.

7. Basis of assessment

7.1 Framework for assessment

The framework on which the contamination status of the Site was assessed was based on guidelines published or approved by the NSW EPA under *Section 105* of the *Contaminated Land Management (CLM) Act 1997*, supplemented by other relevant guidelines where required. The guidelines that were referenced include the following:

- NEPC (2013). National Environment Protection (Assessment of site Contamination) Measure (NEPM), 1999 as amended in May 2013.
- NSW EPA (1995). Contaminated sites: Sampling Design Guidelines, 1995.
- NSW EPA (2020). Contaminated land guidelines: Consultants Reporting on Contaminated Land, 2020.
- NSW DEC (2017). Contaminated Land Management: Guidelines for NSW site Auditor Scheme, (3rd Edition), 2017.
- NSW EPA (2015). Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997, 2015.
- NSW EPA (2014). Waste Classification Guidelines. New South Wales Environment Protection Authority, 2014.

7.2 Soil assessment criteria

The National Environment Protection (Assessment of Site Contamination) Measure (referred to herein as the NEPM) was produced by the federal National Environmental Protection Council (NEPC) in 1999 and has been revised and updated in 2013 by way of the National Environmental Protection (Assessment of site Contamination) Amendment Measure 2013.

The NEPM includes a range of health investigation levels (HILs) and health screening levels (HSLs), ecological investigation levels (EILs) and ecological screening levels (ESLs) for a range of contaminants and for a range of land use and exposure scenarios. The selection of the assessment criteria has been based on the following site specific characteristics:

- Subsurface materials generally comprised coarse, sandy soils.
- There is a potential for direct contact within contaminated soils.
- There is a potential for ecological impacts through incorrect management of contaminated soils during construction.

7.3 Health investigation levels and health screening levels

Health investigation levels (HILs) and HSLs have been developed for a broad range of metals and organic substances and are applicable for assessing human health risk via all relevant pathways of exposure. The HILs are generic to all soil types. HSLs are specific for soil types. Site specific conditions determine the depth to which HILs apply for land uses other than residential (generally to depth of 3 m).

Given that the Site includes a portion of a WWTW, and is proposed to be a desalination plant, commercial/industrial assessment criteria have been adopted to assess potential risks to human health. The criteria are sourced from Schedule B1 of the NEPM and Table 4 of CRC Care Technical Report No. 10 and are summarised below:

- HIL D – Commercial/industrial including premises such as shops, offices, factories and industrial sites.
- HSLs for Direct Contact – HSL D Commercial/industrial.

7.4 Ecological investigation levels and ecological screening levels

Ecological investigation levels (EILs) have been developed for selected metals and organic substances and are applicable for assessing risk to terrestrial ecosystems. EILs depend on land use scenarios and generally apply to the top 2 m of soil. Added contaminant limit based EILs have been derived for As, Cu, Cr III, DDT, naphthalene, Ni, Pb and Zn. EILs have been developed for three generic land use settings including areas of ecological significance, urban residential areas and public open space, and commercial and industrial land uses.

The application of added contaminant limit based EILs is also dependent on site specific soil characteristics including pH, cation exchange capacity and clay content. A selection of samples across the Site were analysed for pH and CEC and the following assumptions have been made based on the results.

- pH analysis was undertaken as part of the contamination investigation and geotechnical works and ranged between 5.7 and 6.7. The average pH value (of 4 samples) was 6.3. A pH of 6.0 has been adopted for this assessment.
- Cation exchange capacity analysis was undertaken during this assessment on six samples. Values ranged between 0.4 milliequivalents per 100 g and 8.4 milliequivalents per 100 g. A CEC of 5 milliequivalents per 100 g has been adopted for this assessment as the most conservative CEC.
- Clay content for sand and fill materials was identified during the geotechnical works (GHD, 2018) and ranged between 0.1% and 5.1% with an average of 2.2%. A clay content of 2.5% was adopted for the Cr III criterion as this is the value within the NEPM closest to the average. The selection of Cr III criterion is not CEC or pH dependent.

Ecological Screening Levels (ESLs) have been developed for selected petroleum hydrocarbon compounds and total recoverable hydrocarbon (TRH) fractions and are applicable for assessing risk to terrestrial ecosystems. ESLs also depend on land use scenarios (identical to EILs) and broadly apply to coarse- and fine-grained soils and various land uses. They are generally applicable to the top 2 m of soil.

As with health assessment criteria, based on the previous and current land use, and the proposed end use for the site, the following assessment criteria have been considered:

- Soil specific added contaminant limits (ACL) and ESLs (coarse textures) for commercial and industrial use.

7.5 Asbestos

The NEPM provides guidance relating to the assessment of known and suspected asbestos contamination in soil and addresses both friable and non-friable forms of asbestos. The health screening levels for asbestos in soil have been adopted from the Western Australian Department of Health (WA DoH) *Guidelines for Remediation and Management of Asbestos Contaminated Sites in Western Australia* (WA DoH 2009).

The NEPM guidance emphasises that the assessment and management of asbestos contamination should take into account the condition of the asbestos materials and the potential for damage and resulting release of asbestos fibres. Therefore, for the purposes of assessing the significance of asbestos in soil contamination, three terms are used as summarised below:

- Bonded asbestos containing material (Bonded ACM) – sound condition although possibly broken or fragments and the asbestos is bound in a matrix.

- Fibrous asbestos (FA) – friable asbestos materials such as severely weathered ACM and asbestos in the form of loose fibrous materials such as insulation.
- Asbestos fines (AF) – including free fibres of asbestos, small fibre bundles and also fragmented ACM that passes through a 7 mm x 7 mm sieve.

From a risk to human health perspective, FA and AF are generally considered to be the equivalent to "friable" asbestos in Safe Work Australia (2011), which is defined therein as 'material that is in a powder form or that can be crumbled, pulverised or reduced to a powder by hand pressure when dry, and contains asbestos'.

Bonded asbestos ACM in sound condition represents a low human health risk. However, both FA and AF materials have the potential to generate, or be associated with, free asbestos fibres and may represent a significant human health risk if disturbed and fibres are made airborne.

Commercial/Industrial "D" health screening levels (HSL) have been adopted as the most appropriate to the Assessment Area. The adopted assessment criteria is outlined in Table 7-1.

Table 7-1 Adopted assessment criteria

Form of Asbestos	Health Screening Level (w/w) – Commercial/Industrial
Bonded ACM	0.05%
FA and AFa (friable asbestos)	0.001%
All forms of asbestos	No visible asbestos for surface soil

a. The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres.

A tiered approach to risk assessment of asbestos contamination is recommended, including the development of an appropriate Conceptual Site Model (CSM). A weight of evidence approach is recommended with consideration given to factors such as the distribution of different fill types, the heterogeneity of the contamination and the uncertainty associated with the sampling methodology.

The NEPM states that if the Tier 1 screening levels are not exceeded, and an appropriate level of investigation has been carried out, then no contamination management actions are required except for ensuring the surface soil is free of visual asbestos. This may be achieved by multidirectional raking or tilling and hand-picking of exposed fragments of bonded ACM. Final visual inspection of the assessment and remediated areas should not detect any visible asbestos.

If exceedances of the Tier 1 screening levels are exceeded either a Tier 2 analysis should be carried out or a conservative management response implemented. The Tier 2 assessment would comprise a qualitative assessment of risk taking into account the nature and extent of contamination; the site specific exposure scenario(s) including the intensity of relevant site activities; the impact of any mitigating factors such as soil type and moisture conditions (and likely variation); the proposed remediation and management measures; and the final use of the site.

7.6 Aesthetics

Assessment of aesthetic issues was undertaken as outlined in Schedule B(1) of the NEPM (1999) which states that 'there are no specific numeric aesthetic guidelines, however site assessment requires balanced consideration of the quantity, type and distribution of foreign material or odours in relation to the specific land use and its sensitivity'.

General assessment considerations included:

- That chemically discoloured soils or large quantities of various types of inert refuse, particularly if unsightly, may cause ongoing concern to site users.
- The depth of the materials, including chemical residues, in relation to the final surface of the Site.
- The need for, and practicality of, any long-term management of foreign material.

The NEPM notes that in some cases, documentation of the nature and distribution of the foreign material may be sufficient to address concerns relating to potential land use restrictions.

7.7 Selected criteria

The methodology for assessing contamination levels in soils was to use the HILs, HSLs, EILs and ESLs (selected as relevant to the area of the site and the proposed land use) as cut off points to classify soils either as:

- Soils not contaminated, which pose no risk to the environment or human health and warrant no further action, i.e. concentrations less than or equal to the EILs/ESLs.
- Soils containing elevated concentrations of contaminants, which may pose a risk to the environment but pose no risk to human health under the proposed land use scenarios i.e. concentrations greater than the ecological values and less than the adopted HILs. A qualitative risk assessment may be sufficient to evaluate the potential impact for the proposed land use.
- Soils significantly contaminated which pose a risk to both the environment and human health, i.e. concentrations significantly greater than relevant investigation or screening levels. Soils in this category would likely require remediation or management, or further assessment by site-specific health and/or ecological risk assessment (Tier 2 or 3) carried out as appropriate for the proposed land use. This will usually require the collection of additional site data. Alternatively, a conservative management approach (such as removal, capping or placement under roadways) may be adopted, depending on the likely cost effectiveness of further assessment when compared with the cost of conservative management.

The assessment criteria used to assess soil contamination levels are provided in Table A, Appendix E.

7.8 Waste classification

Soils that may require offsite disposal as part of site works were classified using the six-step process and criteria detailed in *Waste Classification Guidelines – Part 1: Classification of Waste* (NSW EPA 2014). Analytical results will be assessed against Table 1 of the guidelines to provide an indication of the type of waste classification likely to be present for soils on site.

8. Investigation results

This section presents the results of all sediment and soil investigations undertaken on the site by GHD between July 2018 and September 2020.

Analytical results are summarised in the following tables in Appendix E.

- Table A: Soil analytical results.
- Table B: Waste classification.
- Table C: QA/QC Results.

Laboratory reports are presented in Appendix F.

8.1 Soil profile

Soils encountered during the investigations are described in Table 8-1 below and soil logs are presented in Appendix B.

Table 8-1 Generalised lithology

Depth (mbgl)	Generalised Lithology
GHD 2019	
0 – 1.3	FILL –silty SAND, sandy GRAVEL and CLAY
1.3 -31.0	ALLUVIAL SAND, SAND and silty SANDS. Thin clay and silt lenses
31.0 – 41.0	Alluvial CLAY
GHD 2020	
0 – 0.5	FILL - Sand / Sandy CLAY with gravel
0.3 – 0.5	Clayey SAND, low to medium plasticity, with gravel
0.5 – 1.6	SAND, Poorly graded with shell
8 -9 September 2020	
0 – 0 2	FILL – Clayey SAND / Gravelly SAND (with the exception of BH405, BH407 and BH410 Gravelly SAND encountered to a maximum depth of 0.5 -0.9 m)
0.2 – 1.1	SAND, poorly graded with trace gravel

A slight hydrocarbon odour was observed within 0.2 m of the soil surface at BH401, BH402 and BH404 during collection of soil samples. No staining was observed during the investigation.

One fragment of potential asbestos containing material (PACM) was noted on the track halfway between TP106 and GW102 (70 m west of the construction footprint opposite the proposed drought response desalination plant site). Small fragments of potential ACM were also noted near the surface of GW108.

Samples were screened for Volatile Organic Compound (VOC) vapours using a Photo-Ionisation Detector (PID). All PID results were between 0.1 and 18.2 ppm with the exception of BH404_0.2-0.3 which had a PID of 97.2 ppm. This indicates that there is a low potential for significant contamination by volatile hydrocarbons within the Site.

Groundwater was encountered at all of the test locations, excluding TP101, TP106, HA201, TP205 –TP206 and BH401 - BH412. Water levels were logged in boreholes BH101 (0.95 bgl) and BH105 (4.1 mbgl) in August 2018.

8.2 Soil analytical results

8.2.1 Health

All samples reported contaminant concentrations below the adopted assessment criteria within the Site.

Asbestos (chrysotile) was detected in the form of a loose fibre bundle in one soil sample analysed (TP204_0.0-0.1). Further, a fragment of PACM was noted during GHD 2018 on the track halfway between TP106 and BH102/GW102. Small fragments of PACM were also noted near the surface of BH108/GW108.

Analytical results are summarised in Table A in Appendix E, while detailed laboratory results sheets and Chain of Custody documents are provided in Appendix F.

8.2.2 Ecological

All samples reported concentrations below the adopted assessment criteria with the exception of the following:

- TP106_0.0-0.2 and its duplicate (FD20) with concentrations of copper (194 and 206 mg/kg) and zinc (3,130 and 3,740 mg/kg) above the EILs (commercial/industrial) of 140 mg/kg and 360 mg/kg respectively.
- TP202_0.0-0.1 with concentrations of copper (450 mg/kg) and zinc (730 mg/kg) above the EIL (commercial/ industrial) of 140 mg/kg and 360 mg/kg respectively.
- TP203_0.0-0.1 with concentrations of copper (230 mg/kg) above the EIL (commercial/industrial) of 140 mg/kg.
- TP204_0.0-0.1 with concentrations of copper (370 mg/kg) above the EIL (commercial/ industrial) of 140 mg/kg.

Analytical results are summarised in Table A in Appendix E, while detailed laboratory results sheets and Chain of Custody documents are provided in Appendix F.

8.2.3 Waste classification

Soil results were compared against specific contaminant concentration (SCC) for classification without TCLP as outlined in Table 1 of the NSW EPA (2014) *Waste Classification Guidelines.*

Waste classification results are presented in Table B in Appendix E. In summary, soils within the Site were generally within with General Solid Waste contaminant threshold (CT1) with the exception of the following:

- TP106 0-0.2 and its duplicate (FD20) which reported lead (246 and 287 mg/kg) above the CT1 threshold of 100 mg/kg.
- TP202_0.0-0.1 which reported lead (130 mg/kg) above the CT1 threshold of 100 mg/kg.
- TP204_0.0-0.1 which reported asbestos and lead (130 mg/kg) above the CT1 threshold of 100 mg/kg (lead).
- at BH402_0.2-0.3 which reported chromium (III+VI) (140 mg/kg) above the CT1 threshold of 100 mg/kg.

It is noted that lead and chromium were reported below both the nominated health (1,500 mg/kg and 3,600 mg/kg) and ecological (1,800 mg/kg and 420 mg/kg) investigation levels, which are higher than the CT1 threshold (100 mg/kg).

9. Discussion

9.1 Desk top assessment

Based on the results of the desktop review and site inspection, the following potential areas of environmental concern were identified within the Site and surrounds:

- Placement of fill in the footprint of the former WWTW evaporation ponds.
- Evaporation ponds including sludge from former WWTW operations.
- Spillage or leakage of oils, fuels.
- Waste stored within Hunter Water WWTW (compounds).
- Subsurface infrastructure potentially beneath the site.
- Illegal dumping including asbestos containing materials.

9.2 Site investigations

9.2.1 Subsurface conditions

The typical subsurface profile encountered across the Site comprised varying depths of fill consisting of silty sands, gravels and clays overlying alluvial sands and clays.

Groundwater was encountered at all of the test locations, excluding TP101, TP106, HA201, TP205 –TP206 and BH401 - BH412. Water levels were logged in boreholes BH101 (0.95 bgl) and BH105 (4.1 mbgl) during desalination plant investigations in August 2018. It is noted that groundwater levels are anticipated to vary based on climatic conditions, tidal variations and rainfall. All of the test pits were seen to collapse prior to achieving target depth.

9.2.2 Health-based assessment criteria

All samples analysed as part of the 2019 and 2020 investigations reported contaminant concentrations below the health assessment criteria for commercial/industrial land use.

During GHD 2019, a fragment of non-friable PACM was observed between TP106 and GW102 within the proposed drought response desalination plant site and other small fragments of non-friable PACM were found on the surface near GW108 (70 m west of the construction footprint opposite the proposed drought response desalination plant site). No asbestos was detected in soil samples analysed from this investigation. However, during the GHD 2020 investigation, chrysotile asbestos was detected in the form of a loose fibre bundle in the surface soil sample from TP204. The presence of asbestos and PACM within the Site is considered to relate to historical illegal dumping within and surrounding the areas investigated. The extent of the asbestos contamination around TP204 has not been delineated due to heritage restrictions in the immediate area preventing further disturbance to the surface soils. Investigation of this area will be undertaken following approval of the ACHMP and prior to construction as described in Section 1.5).

9.2.3 Ecological-based assessment criteria

Concentrations of copper and zinc were above commercial/industrial land use EILs in four and two locations respectively. The elevated concentrations of contaminants are most likely attributable to the presence of fill materials and proximity of the samples to the former WWTW evaporation ponds.

Although levels of contaminants were found to be above the commercial/ industrial EILs/ESLs, based on the use of the adjacent area as a WWTW and the proposed future use as a desalination plant, there is currently and future limited ecological amenity in this area and it is considered unlikely that these contaminants would present a significant risk to the environment for the Site and surrounds.

9.3 Waste classification

Based on review of results against the NSW EPA Waste Classification Guidelines, soils would likely be classified as General Solid Waste, with the exception of the following

- Soils where chemical concentrations are above the CT1 threshold, including TP106, TP202, TP204 and BH402 which would be classified as Restricted Solid Waste.
- Soils at TP204 where asbestos has been identified would also be classified as Special Waste - Asbestos in addition to Restricted Solid Waste.

These classifications are only preliminary and it is possible that the above classifications may be reduced with toxicity leachate procedure testing (TCLP), which was not undertaken as part of the scope of works for this project. During construction works, classification of any soils that are to be disposed of off-site would need to be undertaken in accordance with the NSW EPA Waste Classification Guidelines. .

9.4 Updated conceptual site model

Based on the results of the investigations, the conceptual site model has been updated to evaluate potentially complete significant source-pathway-receptor linkages in respect of risks to human health and the environment. The CSM for the site is presented in Table 9-1 below.

Based on the results of this investigation, the contaminants of potential concern (CoPC) in soils are considered to comprise:

- Heavy metals including copper and zinc.
- Asbestos.

Table 9-1 Updated Conceptual site model

Potential Source	Pathway	Receptor	Potential for completeness
Contaminated soils from: -Deposition of wastes and fill -Stored waste stockpiles -Spills or leaks of oils and fuels -Potential hazardous materials from illegal dumping	Inhalation of potentially contaminated dusts	On-site workers, intrusive maintenance workers and visitors	Possible due to identification of asbestos within surface soils at one location and PACM on the surface around the Site. The potential exists for mobilisation of dusts during site redevelopment.
		Future commercial/industrial land use	
		Off-site users	
	Direct contact	On-site workers, intrusive maintenance workers and site visitors	Unlikely as no contaminants in surface soils were identified above HILs across the Site.
		Future commercial/industrial land use	
		Off-site users	Unlikely given the thick cover of vegetation and low potential for mobilisation of contaminated soils to migrate off site.
		Ecological receptors e.g. flora and fauna in surrounding areas	Possible given concentrations of copper and zinc were identified in soils above the EILs. However, the Site has little ecological amenity (current and future). Low potential for off-site migration given thick cover of vegetation and low potential for mobilisation of surface soils.
Potentially **contaminated surface water** run-off	Direct contact	On-site workers and visitors	Unlikely as no contaminants in surface soils were identified above HILs across the Site.
		Off-site users	
		Ecological receptors e.g. flora and fauna in surrounding areas	Possible given soil impacts have been identified above EILs and that there is a potential for surface runoff to be generated on site and potentially migrate off-site.
	Surface water migration to impact groundwater	Ecological receptors offsite	Unlikely due to the low contaminant concentrations identified within the Site.
		Potable groundwater extraction	
Potentially **contaminated groundwater** and possible lateral migration off-site.	Direct Contact (accidental ingestion)	On-site workers, intrusive maintenance workers, site visitors.	Unlikely, as no contaminants in soils were identified above HILs across the Site and limited access to groundwater in the vicinity of the site.
	Lateral migration in groundwater	Ecological receptors offsite	Unlikely due to the low contaminant concentrations identified within the Site to affect groundwater and for groundwater to affect the nearby drainage lines.
		Potable groundwater extraction	

10. Conclusions and recommendations

10.1 Conclusions

In accordance with the objectives detailed in Section 1.3, and based on the information contained within this assessment and limitations outlined in Section 1.5 and Section 11, the following conclusions are made:

- Based on the desktop review and site inspection, the potential sources of contamination were identified to include:
  - Placement of fill in the footprint of the former WWTW evaporation ponds.
  - Evaporation ponds containing sludge.
  - Spillage or leakage of oils and fuels.
  - Waste stored within WWTW (compounds).
  - Subsurface infrastructure potentially containing sludge or asbestos.
  - Illegal dumping including asbestos containing materials.
- The typical subsurface profile across the Site comprised varying depths of fill consisting of silty sands, gravels and clays overlying alluvial sands and clays.
- All samples analysed as part of the investigations considered in this DSI reported contaminant concentrations below the health assessment criteria for commercial/industrial land use.
- Asbestos was identified in surface soils at one location and PACM was identified at two locations on the ground surface. This is considered to relate to historical illegal dumping within and surrounding the Site. The extent of the asbestos has not been delineated due to Aboriginal Cultural Heritage Assessment Report identifying that ground disturbing activities in the area require the preparation and approval of an Aboriginal Cultural Heritage Management Plan, which won't be completed until Project approval have been received.
- Concentrations of copper and zinc were above the EILs, however based on the use of the adjacent area as a WWTW and the proposed future use of the Site as a desalination plant, there is currently and would be limited ecological amenity in this area in the future and is considered unlikely that these contaminants would present a significant risk to the environment for the Site and surrounds.
- Soils within the Site would likely be classified as General Solid Waste, with the exception of soils where chemical concentrations are above the CT1 threshold or contain asbestos which would be classified as Restricted Solid Waste or Special Waste – Asbestos respectively. These classifications may be reduced with further sampling and analysis (TCLP). It is noted that these classifications are preliminary only and further sampling and analysis would be required prior to disposal off site.

Based on the analytical results for soil investigations to date, and taking into account the proposed future land use (commercial/industrial), the potential for significant impacts to human health or sensitive environmental receptors during redevelopment or future use is considered to be low with the exception of the area around TP204 where asbestos was identified in surface soils and any areas where PACM is identified on the ground surface.

10.2 Recommendations

Based on the findings of the investigations, the following recommendations are made with regards to remediation and/or management for the Site prior to redevelopment works for commercial/industrial land use:

- Further investigations be undertaken in the area of TP204 following approval of the ACHMP (refer to limitations in Section 1.5) to assess the extent of asbestos impacts and potential risks to workers during construction.
- Preparation of contaminated soils management plan (CSMP) prior to construction to manage potential risks from disturbance and exposure of potential contamination and unexpected finds within the site during construction. No specific remediation within the Site is proposed at this stage. The CSMP would include requirements for:
  - Further inspection of the ground surface to assess the presence of PACM prior to disturbance.
  - Stockpiling soils away from sensitive receptors such as waterways and drainage lines.
  - Testing of soils to assess suitability if they are to be placed near sensitive receptors.
  - Waste management.
  - Unexpected contaminated soils finds protocols.

The Site has been investigated for contamination as detailed in this report. However, a degree of uncertainty is inherent in any site contamination investigation and a potential exists for undetected contaminated soils, wastes or hazardous building materials to be identified during any future works that disturb the ground surface. In particular, there is a potential for unidentified contaminated materials to be present under areas of the site not investigated or in any fill materials that may be present on site. Indications of potential contamination may include:

- Stained or discoloured fill, soils or seepage water.
- Construction/demolition wastes such as concrete, bricks, timber, tiles, fibre cement sheeting, fragments and pipes.
- General rubbish such as plastic, glass, packaging.
- Imported materials such as ash or slag or coal chitter.

Should unexpected contaminated soils be identified during any future ground works, advice should be sought from a suitably qualified environmental consultant and any additional investigations/remediation be completed in general accordance with guidelines developed or endorsed by NSW EPA.

11. Limitations

This report has been prepared by GHD for Hunter Water Corporation (Hunter Water) and may only be used and relied on by Hunter Water for the purpose agreed between GHD and the Hunter Water as set out in Section 1.4 of this report.

GHD otherwise disclaims responsibility to any person other than Hunter Water arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this Report are based on conditions encountered and information reviewed at the date of preparation of the Report. GHD has no responsibility or obligation to update this Report to account for events or changes occurring subsequent to the date that the Report was prepared. Specifically, this Report does not take into account the effects, implications and consequences of or responses to COVID-19, which is a highly dynamic situation and rapidly changing. These effects, implications, consequences of and responses to COVID-19 may have a material effect on the opinions, conclusions, recommendations, assumptions, qualifications and limitations in this Report, and the entire Report must be re-examined and revisited in light of COVID-19. Where this Report is relied on or used without obtaining this further advice from GHD, to the maximum extent permitted by law, GHD disclaims all liability and responsibility to any person in connection with, arising from or in respect of this Report whether such liability arises in contract, tort (including negligence) or under statute.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

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The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

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

Site conditions (including the presence of hazardous substances and/or site contamination) may change after the date of this Report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.

12. References

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NSW EPA (2015). Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997, 2015.

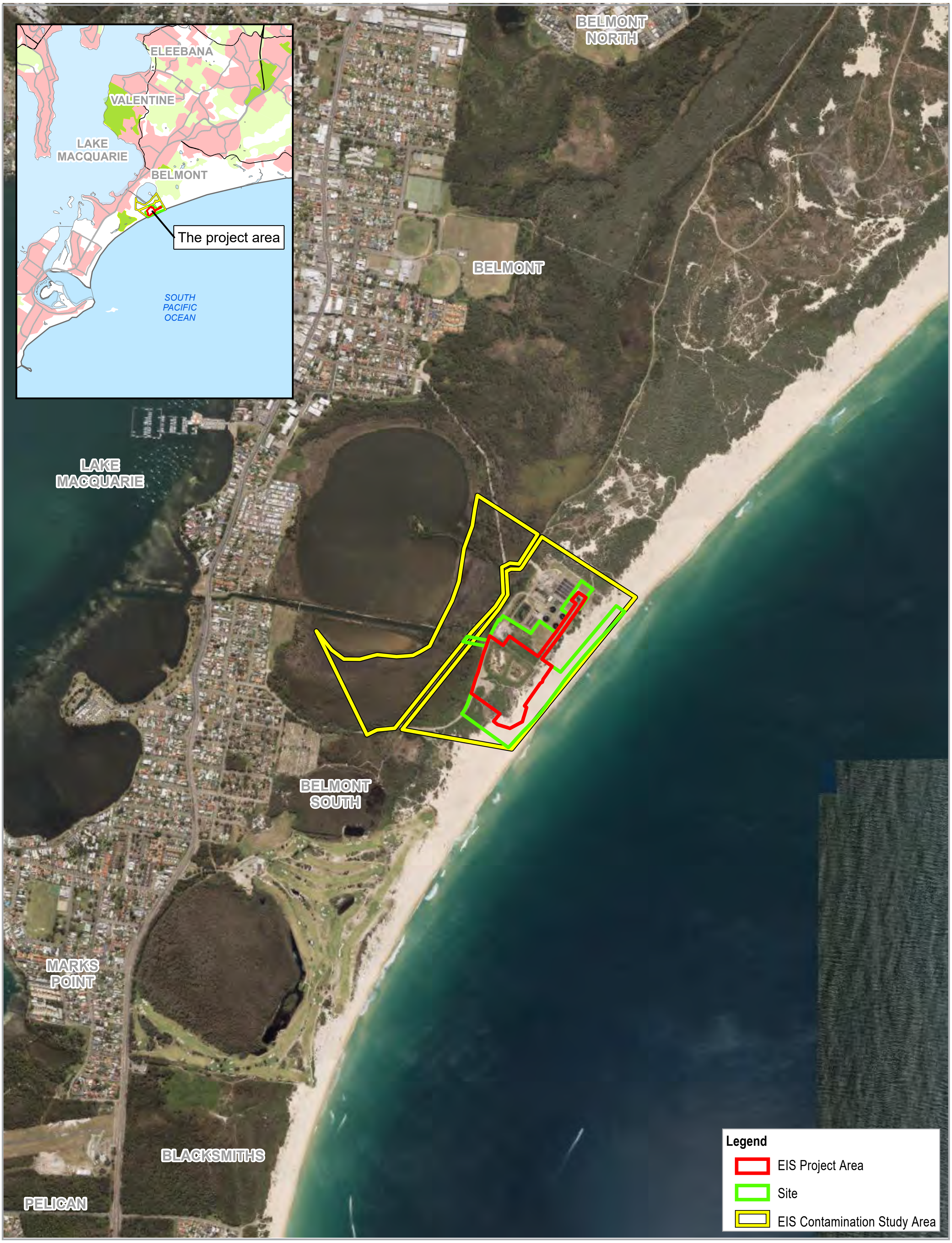
NSW EPA (2020) Guidelines for Consultants Reporting on Contaminated Land.

RCA, 2002, Upgrade of Belmont WWTW, Document Reference 566b-033/0.

SKM, 2012, Spoil Investigation Report, Document Reference EN03103-N-CL-RP-0002.

Appendices

Appendix A – Figures



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Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

Hunter Water Corporation
Belmont Temporary Desalination Plant Design and EA
Detailed Site Investigation

Project No.	**22-19573**
Revision No.	**A**
Date	**29/09/2020**

Site Locality Plan

Figure 1

G:\22\19573\Design\04 Deliverables\02 Other\2219573_DSI_Variation_A.aprx
Print date: 30 Sep 2020 - 11:27

Data source: LPI: DTDB / DCDB, 2017; public_NSW_Imagery: © Department of Customer Service 2020. Sampling locations digitised from image - for visual purposes only. Created by: tmorton

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Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

GHD

Hunter Water Corporation
Belmont Temporary Desalination Plant Design and EA
Detailed Site Investigation

Project No.	**22-19573**
Revision No.	**A**
Date	**30/09/2020**

Amended Project Area

Figure 2

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Paper Size ISO A4

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Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

Hunter Water Corporation
Belmont Temporary Desalination Plant Design and EA
Detailed Site Investigation

Contamination Sampling Plan – Current and Previous Investigations

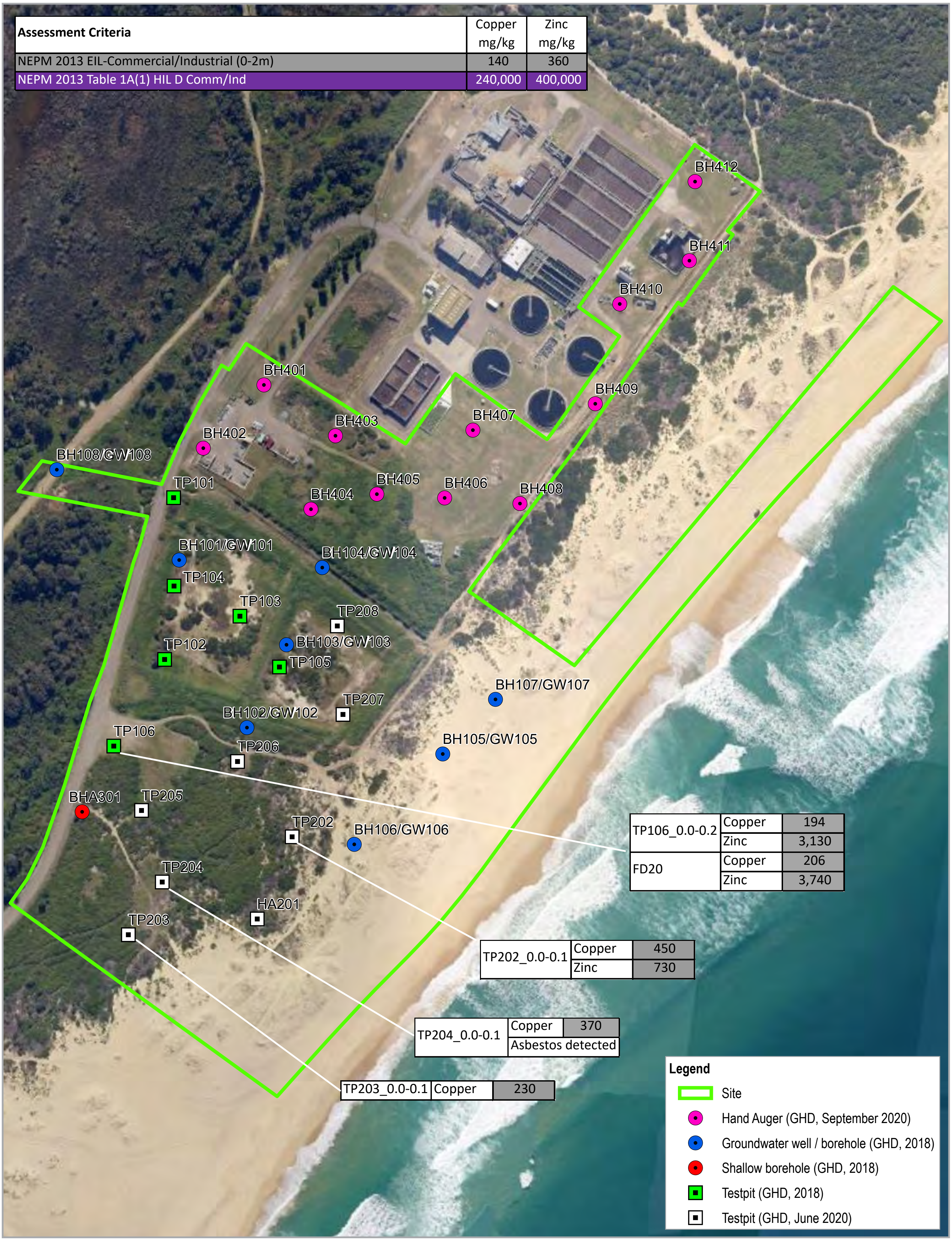
Project No.	**22-19573**
Revision No.	**A**
Date	**30/09/2020**

Figure 3

G:\22\19573\Design\04 Deliverables\02 Other\2219573_DSI_Variation_A.aprx
Print date: 30 Sep 2020 - 11:28

Data source: LPI: DTDB / DCDB, 2017; public_NSW_Imagery: © Department of Customer Service 2020. Sampling locations digitised from image - for visual purposes only. Created by: tmorton

Assessment Criteria	Copper mg/kg	Zinc mg/kg
NEPM 2013 EIL-Commercial/Industrial (0-2m)	140	360
NEPM 2013 Table 1A(1) HIL D Comm/Ind	240,000	400,000



TP106_0.0-0.2	Copper	194
	Zinc	3,130
FD20	Copper	206
	Zinc	3,740

TP202_0.0-0.1	Copper	450
	Zinc	730

TP204_0.0-0.1	Copper	370
	Asbestos detected	

TP203_0.0-0.1	Copper	230

Legend

▭	Site
●	Hand Auger (GHD, September 2020)
●	Groundwater well / borehole (GHD, 2018)
●	Shallow borehole (GHD, 2018)
▣	Testpit (GHD, 2018)
▣	Testpit (GHD, June 2020)

Paper Size ISO A4

0 30 60 90 120

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

Hunter Water Corporation
Belmont Temporary Desalination Plant Design and EA
Detailed Site Investigation

Project No. **22-19573**
Revision No. **A**
Date **30/09/2020**

Exceedances of criteria

Figure 4

G:\22\19573\Design\04 Deliverables\02 Other\2219573_DSI_Variation_A.aprx
Print date: 30 Sep 2020 - 16:08

Data source: LPI: DTDB / DCDB, 2017; public_NSW_Imagery: © Department of Customer Service 2020. Sampling locations digitised from image - for visual purposes only. Created by: tmorton

Appendix B – Historical aerial photographs

NSW4309 (M2029) Lake Macquarie City Council Run 8 19-5-1996

Lake Macquarie NSW3730 25-4-1990

BHPB Engineering 1987

Newcastle Run 16 4/9/1983

Lake Macquarie Run 1 27/5/1975

Northumberland Project Run 8 22/08/1965

Appendix C – Borehole logs

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE HA201

Page 1 of 1

Client John Holland Pty Ltd	**Drill Co.** -	**Easting** -33.050570539198816
Project Supplementary Geotechnical & Contamination Assessment	**Driller** -	**Northing** 151.66852447204292
Project No. 12520831	**Rig Type** -	**Grid Ref** GDA94_MGA_zone_56
Site Belmont Temporary Desalination Plant	**Drill Method** Hand Auger	**Elevation**
Location Ocean Park Drive, Belmont NSW	**Total Depth (m)** 0.4	**Logged By** A.B
Date Drilled 10/06/2020	**Diameter (mm)** 50	**Checked By** K.W

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
	HA	0.6	HA201_0.0-0.1 (FD03)		▨	SW - SAND, medium to coarse grained, dark brown-grey, well graded with gravel, roots and shell (FILL).	M	L	no odour no staining.	
0.02										-0.02
0.04										-0.04
0.06										-0.06
0.08										-0.08
0.1						SP - SAND, medium to coarse grained, poorly graded, dark brown- yellow, with gravel, and shells (NATURAL - SOIL).	SM	L	no odour no staining.	-0.1
0.12										-0.12
0.14										-0.14
0.16										-0.16
0.18										-0.18
0.2		0.4	HA201_0.2-0.3							-0.2
0.22										-0.22
0.24										-0.24
0.26										-0.26
0.28										-0.28
0.3										-0.3
0.32										-0.32
0.34										-0.34
0.36										-0.36
0.38										-0.38
0.4						Termination Depth at: 0.40 m. Hang Auger test pit collapse.				-0.4

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	**Moisture Abbreviations**	**Consistency Abbreviations**	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE TP202

Page 1 of 1

Client John Holland Pty Ltd	**Drill Co.** Justin Ridley Excavations	**Easting** -33.04988959338516
Project Supplementary Geotechnical and Contamination Assessmen	**Driller** Anthony Fahey	**Northing** 151.66854525916278
Project No. 12520831	**Rig Type** Kobelco SK55SRX Excavator	**Grid Ref** GDA94_MGA_zone_56
Site Belmont Temporary Desalination Plant	**Drill Method** Bucket Excavation	**Elevation**
Location Ocean Park Drive, Belmont NSW	**Total Depth (m)** 1.1	**Logged By** A.B
Date Drilled 10/06/2020	**Width (m)** 1.0	**Checked By** K.W

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0.0	BE	0.4	TP202_0.0-0.1			SW - SAND, angular, dark brown, with gravel, and roots (FILL).	M	L	no odour no staining - potential slag on surface	
0.2		0.2	TP202_0.2-0.3			SP - SAND, medium to coarse grained, poorly graded, brown- yellow, with fine gravel, and shells (NATURAL - SOIL).	M	L	no odour no staining.	-0.2
0.5		0.2	TP202_0.5-0.6							-0.5
0.9						SP - SAND, medium to coarse grained, poorly graded, brown- yellow, with fine gravel, and shells (NATURAL - SOIL).	M	L	no odour no staining.	-0.9
1		0.2	TP202_1.0-1.1	▽						-1
1.1						Termination Depth at: 1.10 m. Test pit collapse.				-1.1

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations

AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler

Moisture Abbreviations

D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated

Consistency Abbreviations

Granular Soils VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense

Cohesive Soils VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

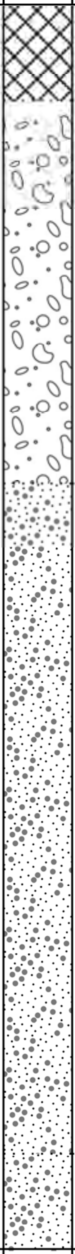
SOIL BORE TP203

Page 1 of 1

Client John Holland Pty Ltd
Project Supplementary Geotechnical & Contamination Assessment
Project No. 12520831
Site Belmont Temporary Desalination Plant
Location Ocean Park Drive, Belmont NSW
Date Drilled 10/06/2020

Drill Co. Justin Ridley Excavations
Driller Anthony Fahey
Rig Type Kobelco SK55SRX Excavator
Drill Method Bucket Excavation
Total Depth (m) 1.3
Width (m) 1.0

Easting -33.05039669852704
Northing 151.66770656593144
Grid Ref GDA94_MGA_zone_56
Elevation
Logged By A.B
Checked By K.W



Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
	BE	0.6	TP204_0.0-0.1		SW - SAND, angular, dark brown, well graded with gravel, and roots (FILL).	M	D	no odour no staining.	
0.1					SP - SAND, medium to coarse grained, poorly graded, dark grey, with gravel (FILL).	SM	L	no odour no staining.	-0.1
0.2		0.4	TP203_0.2-0.3 (FD02)						-0.2
0.3									-0.3
0.4									-0.4
0.5		0.4	TP203_0.5-0.6		SP - SAND, medium to coarse grained, poorly graded, pale grey, with fine gravel, and shells (NATURAL - SOIL).	M	L	no odour no staining.	-0.5
0.6									-0.6
0.7									-0.7
0.8									-0.8
0.9									-0.9
1		0.7	TP203_1.0-1.1						-1
1.1									-1.1
1.2				⊻	SP - SAND, medium to coarse grained, poorly graded, dark brown, with: shells (NATURAL - SOIL).	W	D	no odour no staining.	-1.2
1.3					Termination Depth at: 1.30 m. Test pit collapse.				-1.3

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations

AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler

Moisture Abbreviations

D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated

Consistency Abbreviations

Granular Soils VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense

Cohesive Soils VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE TP204

Page 1 of 1

Client John Holland Pty Ltd
Project Supplementary Geotechnical & Contamination Assessment
Project No. 12520831
Site Belmont Temporary Desalination Plant
Location Ocean Park Drive, Belmont NSW
Date Drilled 10/06/2020

Drill Co. Justin Ridley Excavations
Driller Anthony Fahey
Rig Type Kobelco SK55SRX Excavator
Drill Method Bucket Excavation
Total Depth (m) 1.6
Width (m) 1.0

Easting -33.05062707513571
Northing 151.66743490844965
Grid Ref GDA94_MGA_zone_56
Elevation
Logged By A.B
Checked By K.W

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
	BE	0.5	TP204_0.0-0.1			SW - SAND, angular, dark brown, well graded with gravel, and roots (FILL).	M	D	no odour no staining.	
0.1						SP - SAND, medium to coarse grained, poorly graded, dark grey, with gravel (FILL).	M	L	no odour no staining.	-0.1
0.2		0.5	TP204_0.2-0.3							-0.2
0.3										-0.3
0.4										-0.4
0.5		0.3	TP204_0.5-0.6			SP - SAND, medium to coarse grained, poorly graded, pale grey, with fine gravel and shells (NATURAL - SOIL).	M	L	no odour no staining.	-0.5
0.6										-0.6
0.7										-0.7
0.8										-0.8
0.9										-0.9
1		0.4	TP204_1.0-1.1							-1
1.1										-1.1
1.2				▽		SP - SAND, medium to coarse grained, poorly graded, dark brown, with shells (NATURAL - SOIL).	W	D	no odour no staining.	-1.2
1.3										-1.3
1.4										-1.4
1.5		0.4	TP204_1.5-1.6							-1.5
1.6						Termination Depth at: 1.60 m. Test pit collapse.				-1.6

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations

AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler

Moisture Abbreviations

D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated

Consistency Abbreviations

Granular Soils VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense

Cohesive Soils VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE TP205

Page 1 of 1

Client John Holland Pty Ltd	**Drill Co.** Justin Ridley Excavations	**Easting** -33.049070220440626
Project Supplementary Geotechnical & Contamination Assessment	**Driller** Anthony Fahey	**Northing** 151.6554230544716
Project No. 12520831	**Rig Type** Kobelco SK55SRX Excavator	**Grid Ref** GDA94_MGA_zone_56
Site Belmont Temporary Desalination Plant	**Drill Method** Bucket Excavation	**Elevation**
Location Ocean Park Drive, Belmont NSW	**Total Depth (m)** 1.6	**Logged By** A.B
Date Drilled 10/06/2020	**Width (m)** 1.0	**Checked By** K.W

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
	BE	1.0	TP205_0.0-0.1			CH - Sandy CLAY, high plasticity, angular, brown, with gravel and roots (FILL).	M	D	no odour no staining.	
0.1						SW - Clayey SAND, medium to coarse grained, well graded, angular, brown, with coal, and gravel, concrete and bitumen (FILL).	M	S	no odour no staining.	-0.1
0.2										-0.2
0.3						SP - SAND, medium to coarse grained, poorly graded, brown, with shells (NATURAL - SOIL).	M	L	no odour no staining.	-0.3
0.4										-0.4
0.5		1.2	TP205_0.5-0.6 (FD01)							-0.5
0.6										-0.6
0.7										-0.7
0.8										-0.8
0.9										-0.9
1		1.2	TP205_1.0-1.1							-1
1.1										-1.1
1.2						SP - SAND, medium to coarse grained, poorly graded, pale brown, with shells (NATURAL - SOIL).	M	L	no odour no staining.	-1.2
1.3										-1.3
1.4										-1.4
1.5		0.9	TP205_1.5-1.6							-1.5
1.6						Termination Depth at: 1.60 m. Test pit collapse.				-1.6

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	**Moisture Abbreviations**	**Consistency Abbreviations**	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE TP206

Page 1 of 1

Client John Holland Pty Ltd	**Drill Co.** Justin Ridley Excavations	**Easting** -33.0507026379928
Project Supplementary Geotechnical & Contamination Assessment	**Driller** Anthony Fahey	**Northing** 151.66758159175515
Project No. 12520831	**Rig Type** Kobelco SK55SRX Excavator	**Grid Ref** GDA94_MGA_zone_56
Site Belmont Temporary Desalination Plant	**Drill Method** Bucket Excavation	**Elevation**
Location Ocean Park Drive, Belmont NSW	**Total Depth (m)** 1.6	**Logged By** A.B
Date Drilled 10/06/2020	**Diameter (m)** 1.0	**Checked By** K.W

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
	BE	0.7	TP206_0.0-0.1			SW - SAND, angular, dark brown, well graded with gravel, and roots (FILL).	M	D	no odour no staining.	
0.1						SW - Clayey SAND, medium to coarse grained, well graded, dark grey, with gravel (FILL).	M	L	no odour no staining.	-0.1
0.2		1.1	TP206_0.2-0.3							-0.2
0.3										-0.3
0.4										-0.4
0.5		0.9	TP206_0.5-0.6			SP - SAND, medium to coarse grained, poorly graded, brown- yellow, with fine gravel and shells (NATURAL - SOIL).	M	L	no odour no staining.	-0.5
0.6										-0.6
0.7										-0.7
0.8										-0.8
0.9										-0.9
1		0.9	TP206_1.0-1.1							-1
1.1										-1.1
1.2										-1.2
1.3										-1.3
1.4						CH - Sandy CLAY, high plasticity, medium to coarse grained, dark black, with roots (NATURAL - SOIL).	M	VD	organic odour no staining.	-1.4
1.5		1.3	TP206_1.5-1.6							-1.5
1.6						Termination Depth at: 1.60 m. Test pit collapse.				-1.6

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	**Moisture Abbreviations**	**Consistency Abbreviations**	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE TP207

Page 1 of 1

Client John Holland Pty Ltd
Project Supplementary Geotechnical & Contamination Assessment
Project No. 12520831
Site Belmont Temporary Desalination Plant
Location Ocean Park Drive, Belmont NSW
Date Drilled 10/06/2020

Drill Co. Justin Ridley Excavations
Driller Anthony Fahey
Rig Type Kobelco SK55SRX Excavator
Drill Method Bucket Excavation
Total Depth (m) 0.3
Width (m) 1.0

Easting -33.049407214885764
Northing 151.66889612562954
Grid Ref GDA94_MGA_zone_56
Elevation
Logged By A.B
Checked By K.W

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	**LITHOLOGICAL DESCRIPTION** Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	**COMMENTS/ CONTAMINANT INDICATORS** Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
	BE	0.4	TP207_0.0-0.1			SP - SAND, medium to coarse grained, poorly graded, brown- grey, with fine gravel, and shells (NATURAL - SOIL).	M	L	no odour no staining.	
0.02										-0.02
0.04										-0.04
0.06										-0.06
0.08										-0.08
0.1										-0.1
0.12										-0.12
0.14										-0.14
0.16										-0.16
0.18										-0.18
0.2		0.2	TP207_0.2-0.3 (FD04)			SP - SAND, medium to coarse grained, poorly graded, brown- yellow, with fine gravel and shells (NATURAL - SOIL).	W	L	no odour no staining.	-0.2
0.22										-0.22
0.24										-0.24
0.26										-0.26
0.28										-0.28
0.3				∇		Termination Depth at: 0.30 m. waterlogging of test pit.				-0.3

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE TP208

Page 1 of 1

Client John Holland Pty Ltd
Project Supplementary Geotechnical & Contamination Assessment
Project No. 12520831
Site Belmont Temporary Desalination Plant
Location Ocean Park Drive, Belmont NSW
Date Drilled 10/06/2020

Drill Co. Justin Ridley Excavations
Driller Anthony Fahey
Rig Type Kobelco SK55SRX Excavator
Drill Method Bucket Excavation
Total Depth (m) 1.1
Width (m) 1.0

Easting -33.04872706532478
Northing 151.6687831375748
Grid Ref GDA94_MGA_zone_56
Elevation
Logged By A.B
Checked By K.W

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0.0	BE	0.4	TP208_0.0-0.1 (FD05)		▨	SP - SAND, medium to coarse grained, poorly graded, brown- grey, with fine gravel, and shells and roots (FILL).	M	L	no odour no staining.	
0.05										-5.000
0.2		0.2	TP208_0.2-0.3			SP - SAND, medium to coarse grained, poorly graded, brown- yellow, with fine gravel and shells (NATURAL - SOIL).	M	L	no odour no staining.	-0.2
0.3				▽						-0.3
0.5		0.2	TP208_0.5-0.6							-0.5
0.7						SP - SAND, medium to coarse grained, poorly graded, brown- yellow, with fine gravel and shells (NATURAL - SOIL).	W	L	no odour no staining.	-0.7
1		0.2	TP208_1.0-1.1			SP - Silty SAND, fine to medium grained, black (NATURAL - SOIL).	W	VS	no odour no staining.	-1
1.1						Termination Depth at: 1.10 m. Target depth achieved.				-1.1

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH401

Page 1 of 1

Client Hunter Water Corporation	**Drill Co.** -	**Easting** -33.0472727213055
Project Belmont Temporary Desalination Plant Design	**Driller** AB	**Northing** 151.668251305819
Project No. 2219573	**Equipment** 50 mm hand auger	**Grid Ref** GDA94_MGA_zone_55
Site Belmont Temporary Desalination Plant	**Drill Method** HA	**Elevation (m)** 3.0
Location Ocean Park Road, Belmont NSW 2280	**Total Depth (m)** 1.1	**Logged By** AB
Date Drilled 08/09/2020	**Diameter (mm)** 50	**Checked By** KW

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
	HA			▨	SW - Clayey SAND, well graded, brown, with roots, and gravel (FILL).	SM	L	no staining, slight hydrocarbon odour.	
0.05				▨					2.95
0.1				▨					2.9
0.15				▨					2.85
		18.2	BH401_0.2-0.3	▨					
0.2				░	SP - SAND, poorly graded, pale brown- grey (NATURAL - SOIL).	M	S	no staining, no odour.	2.8
0.25				░					2.75
0.3				░					2.7
0.35				░					2.65
0.4				░					2.6
0.45				░					2.55
0.5				░					2.5
0.55				░					2.45
		9.1	BH401_0.5-0.6 (FD01)	░					
0.6				░					2.4
0.65				░					2.35
0.7				░					2.3
0.75				░					2.25
0.8				░					2.2
0.85				░					2.15
0.9				░					2.1
0.95				░					2.05
1				░					2
1.05				░					1.95
		6.6	BH401_1.0-1.1	░					
1.1					Termination Depth at: 1.10 m. Target depth achieved.				1.9
1.15									1.85

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

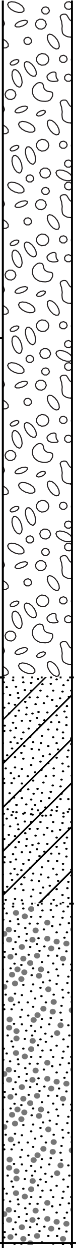
SOIL BORE BH402

Page 1 of 1

Client Hunter Water Corporation
Project Belmont Temporary Desalination Plant Design
Project No. 2219573
Site Belmont Temporary Desalination Plant
Location Ocean Park Road, Belmont NSW 2280
Date Drilled 08/09/2020

Drill Co. -
Driller AB
Equipment 50 mm hand auger
Drill Method HA
Total Depth (m) 1.1
Diameter (mm) 50

Easting -33.0476605100557
Northing 151.667992891744
Grid Ref GDA94_MGA_zone_55
Elevation (m) 3.0
Logged By AB
Checked By KW



Depth (m)	Drilling Method	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
	HA				GW - Sandy GRAVEL, coarse grained, well graded, angular to subangular, pale brown, with clay, and roots (FILL).	D	VL	no staining, slight hydrocarbon odour.	
0.05									2.95
0.1									2.9
0.15									2.85
0.2									2.8
0.25									2.75
0.3		10.4	BH402_0.2-0.3						2.7
0.35									2.65
0.4									2.6
0.45									2.55
0.5									2.5
0.55									2.45
0.6		8.5	BH402_0.5-0.6		SW - Clayey SAND, well graded, brown, with roots, and gravel (FILL).	SM	L	no staining, no odour.	2.4
0.65									2.35
0.7									2.3
0.75									2.25
0.8					SP - SAND, poorly graded, dark brown (NATURAL - SOIL).	M	S	no staining, no odour.	2.2
0.85									2.15
0.9									2.1
0.95									2.05
1									2
1.05									1.95
1.1		8.5	BH402_1.0-1.1		Termination Depth at: 1.10 m. Target depth achieved.				1.9
1.15									1.85

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	**Moisture Abbreviations**	**Consistency Abbreviations**	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH403

Page 1 of 1

Client Hunter Water Corporation
Project Belmont Temporary Desalination Plant Design
Project No. 2219573
Site Belmont Temporary Desalination Plant
Location Ocean Park Road, Belmont NSW 2280
Date Drilled 08/09/2020

Drill Co. -
Driller AB
Equipment 50 mm hand auger
Drill Method HA
Total Depth (m) 1.1
Diameter (mm) 50

Easting -33.047581971623
Northing 151.66886662133
Grid Ref GDA94_MGA_zone_55
Elevation (m) 4.0
Logged By AB
Checked By KW

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
	HA				SW - Clayey SAND, well graded, brown, with roots, and gravel (FILL).	SM	L	no staining, no odour.	
0.05									3.95
0.1									3.9
0.15									3.85
0.2					SP - SAND, poorly graded, pale brown- grey (NATURAL - SOIL).	M	S	no staining, organic odour.	3.8
0.25									3.75
0.3		13.6	BH403_0.2-0.3						3.7
0.35									3.65
0.4									3.6
0.45									3.55
0.5									3.5
0.55									3.45
0.6		12.4	BH403_0.5-0.6						3.4
0.65									3.35
0.7									3.3
0.75									3.25
0.8									3.2
0.85									3.15
0.9									3.1
0.95									3.05
1									3
1.05									2.95
1.1		7.6	BH403_1.0-1.1		Termination Depth at: 1.10 m. Target depth achieved.				2.9
1.15									2.85

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH404

Client Hunter Water Corporation	**Drill Co.** -	**Easting** -33.0478189699352
Project Belmont Temporary Desalination Plant Design	**Driller** AB	**Northing** 151.668864609674
Project No. 2219573	**Equipment** 50 mm hand auger	**Grid Ref** GDA94_MGA_zone_55
Site Belmont Temporary Desalination Plant	**Drill Method** HA	**Elevation (m)** 4.0
Location Ocean Park Road, Belmont NSW 2280	**Total Depth (m)** 1.1	**Logged By** AB
Date Drilled 08/09/2020	**Diameter (mm)** 50	**Checked By** KW

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
	HA				SW - Clayey SAND, well graded, brown, with roots, and gravel (FILL).	SM	L	no staining, slight hydrocarbon odour.	
0.05									3.95
0.1									3.9
0.15									3.85
0.2					SW - Clayey SAND, well graded, brown, with roots, and gravel (FILL).	SM	L	no staining, no odour.	3.8
0.25									3.75
0.3		97.2	BH404_0.2-0.3						3.7
0.35									3.65
0.4									3.6
0.45									3.55
0.5									3.5
0.55									3.45
0.6		3.5	BH404_0.5-0.6		SP - SAND, poorly graded, pale brown- grey (NATURAL - SOIL).	M	S	no staining, organic odour.	3.4
0.65									3.35
0.7									3.3
0.75									3.25
0.8									3.2
0.85									3.15
0.9									3.1
0.95									3.05
1									3
1.05									2.95
1.1		9.3	BH404_1.0-1.1		Termination Depth at: 1.10 m. Target depth achieved.				2.9
1.15									2.85

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH405

Page 1 of 1

Client Hunter Water Corporation
Project Belmont Temporary Desalination Plant Design
Project No. 2219573
Site Belmont Temporary Desalination Plant
Location Ocean Park Road, Belmont NSW 2280
Date Drilled 08/09/2020

Drill Co. -
Driller AB
Equipment 50 mm hand auger
Drill Method HA
Total Depth (m) 0.8
Diameter (mm) 50

Easting -33.0478757154197
Northing 151.669258307666
Grid Ref GDA94_MGA_zone_55
Elevation (m) 5.0
Logged By AB
Checked By KW

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
	HA			▨	SW - Gravelly SAND, well graded, brown, with roots, gravel, concrete and brick (FILL).	SM	L	no staining, no odour.	
0.05				▨					4.95
0.1				▨					4.9
0.15				▨					4.85
0.2				▨					4.8
0.25				▨					4.75
0.3		12.4	BH405_0.2-0.3 (FD02)	▨					4.7
0.35				▨					4.65
0.4				▨					4.6
0.45				▨					4.55
0.5				▨					4.5
0.55				▨					4.45
0.6		7.7	BH405_0.5-0.6	▨					4.4
0.65				▨					4.35
0.7				▨					4.3
0.75				▨					4.25
0.8					Termination Depth at: 0.80 m. Refusal on concrete debris.				4.2

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	**Moisture Abbreviations**	**Consistency Abbreviations**	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH406

Page 1 of 1

Client Hunter Water Corporation
Project Belmont Temporary Desalination Plant Design
Project No. 2219573
Site Belmont Temporary Desalination Plant
Location Ocean Park Road, Belmont NSW 2280
Date Drilled 08/09/2020

Drill Co. -
Driller AB
Equipment 50 mm hand auger
Drill Method HA
Total Depth (m) 1.1
Diameter (mm) 50

Easting -33.0479203909636
Northing 151.669743787497
Grid Ref GDA94_MGA_zone_55
Elevation (m) 7.0
Logged By AB
Checked By KW

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
	HA			▨	SW - Gravelly SAND, well graded, brown, with roots, gravel, concrete and brick (FILL).	SM	L	no staining, no odour.	
0.05									6.95
0.1									6.9
0.15									6.85
0.2									6.8
0.25									6.75
0.3		11.9	BH406_0.2-0.3 (FD03)						6.7
0.35									6.65
0.4				▧	SP - Clayey SAND, medium to coarse grained, poorly graded, pale brown- grey with gravel and black clay inclusions (POSSIBLE FILL).	M	MD	no staining, no odour.	6.6
0.45									6.55
0.5									6.5
0.55									6.45
0.6		10.3	BH406_0.5-0.6						6.4
0.65									6.35
0.7									6.3
0.75									6.25
0.8				⁙	SP - SAND, medium to coarse grained, poorly graded, pale black- brown (NATURAL - SOIL).	M	MD	no staining, no odour.	6.2
0.85									6.15
0.9									6.1
0.95									6.05
1									6
1.05									5.95
1.1		9.4	BH406_1.0-1.1						5.9
1.15					Termination Depth at: 1.10 m. Target depth achieved.				5.85

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations

AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler

Moisture Abbreviations

D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated

Consistency Abbreviations

Granular Soils VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense

Cohesive Soils VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH407

Client Hunter Water Corporation
Project Belmont Temporary Desalination Plant Design
Project No. 2219573
Site Belmont Temporary Desalination Plant
Location Ocean Park Road, Belmont NSW 2280
Date Drilled 09/09/2020

Drill Co. -
Driller AB
Equipment 50 mm hand auger & LH shovel
Drill Method HE, HA
Total Depth (m) 1.1
Diameter (mm) 200

Easting -33.0475674709305
Northing 151.670033382252
Grid Ref GDA94_MGA_zone_55
Elevation (m) 7.0
Logged By AB
Checked By KW

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
	HE				SW - Gravelly SAND, fine to medium grained, well graded, brown, with roots, and gravel, ceramic, concrete, charcoal and brick (FILL).	D	D	no staining, no odour.	
0.05									6.95
0.1									6.9
0.15									6.85
0.2									6.8
0.25									6.75
0.3		3.2	BH407_0.2-0.3 (FD04)						6.7
0.35									6.65
0.4									6.6
0.45									6.55
0.5	HA								6.5
0.55									6.45
0.6		0.4	BH407_0.5-0.6						6.4
0.65									6.35
0.7									6.3
0.75									6.25
0.8									6.2
0.85									6.15
0.9					SP - SAND, medium to coarse grained, poorly graded, brown, with trace gravel (NATURAL - SOIL).	M	S	no staining, no odour.	6.1
0.95									6.05
1		3.0	BH407_1.0-1.1						6
1.05									5.95
1.1					Termination Depth at: 1.10 m. Target depth achieved.				5.9
1.15									5.85

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations

AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler

Moisture Abbreviations

D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated

Consistency Abbreviations

Granular Soils VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense

Cohesive Soils VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH408

Page 1 of 1

Client Hunter Water Corporation	**Drill Co.** -	**Easting** -33.0480260867625
Project Belmont Temporary Desalination Plant Design	**Driller** AB	**Northing** 151.670033382252
Project No. 2219573	**Equipment** 50 mm hand auger	**Grid Ref** GDA94_MGA_zone_55
Site Belmont Temporary Desalination Plant	**Drill Method** HA	**Elevation (m)** 7.0
Location Ocean Park Road, Belmont NSW 2280	**Total Depth (m)** 1.1	**Logged By** AB
Date Drilled 09/09/2020	**Diameter (mm)** 50	**Checked By** KW

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
	HA				SP - SAND, medium to coarse grained, poorly graded, brown- grey, with roots, and trace gravel (FILL).	D	L	no staining, no odour.	
0.05									6.95
0.1									6.9
0.15									6.85
0.2					SP - SAND, medium to coarse grained, poorly graded, brown- grey, with trace gravel (NATURAL - SOIL).	D	L	no staining, no odour.	6.8
0.25									6.75
0.3		3.4	BH408_0.2-0.3						6.7
0.35									6.65
0.4									6.6
0.45									6.55
0.5									6.5
0.55									6.45
0.6		2.5	BH408_0.5-0.6						6.4
0.65									6.35
0.7									6.3
0.75									6.25
0.8									6.2
0.85									6.15
0.9									6.1
0.95									6.05
1		1.1	BH408_1.0-1.1						6
1.05									5.95
1.1					Termination Depth at: 1.10 m. Target depth achieved.				5.9
1.15									5.85

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH409

Page 1 of 1

Client Hunter Water Corporation
Project Belmont Temporary Desalination Plant Design
Project No. 2219573
Site Belmont Temporary Desalination Plant
Location Ocean Park Road, Belmont NSW 2280
Date Drilled 09/09/2020

Drill Co. -
Driller AB
Equipment 50 mm hand auger
Drill Method HA
Total Depth (m) 1.1
Diameter (mm) 50

Easting -33.0474428739399
Northing 151.670828321949
Grid Ref GDA94_MGA_zone_55
Elevation (m) 7.0
Logged By AB
Checked By KW

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
	HA				SP - SAND, fine to medium grained, poorly graded, brown, with roots (FILL).	D	L	no staining, no odour.	
0.05									6.95
0.1									6.9
0.15									6.85
0.2									6.8
0.25									6.75
0.3		2.5	BH409_0.2-0.3						6.7
					SP - SAND, medium to coarse grained, poorly graded, pale brown, with trace gravel (NATURAL - SOIL).	M	S	no staining, no odour.	
0.35									6.65
0.4									6.6
0.45									6.55
0.5									6.5
0.55									6.45
0.6		2.2	BH409_0.5-0.6						6.4
0.65									6.35
0.7									6.3
0.75									6.25
0.8									6.2
0.85									6.15
0.9									6.1
0.95									6.05
1		2.8	BH409_1.0-1.1						6
1.05									5.95
1.1					Termination Depth at: 1.10 m. Target depth achieved.				5.9
1.15									5.85

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH410

Page 1 of 1

Client Hunter Water Corporation	**Drill Co.** -	**Easting** -33.046904001385
Project Belmont Temporary Desalination Plant Design	**Driller** AB	**Northing** 151.671206261963
Project No. 2219573	**Equipment** 50 mm hand auger & LH shovel	**Grid Ref** GDA94_MGA_zone_55
Site Belmont Temporary Desalination Plant	**Drill Method** HE, HA	**Elevation (m)** 7.0
Location Ocean Park Road, Belmont NSW 2280	**Total Depth (m)** 1.1	**Logged By** AB
Date Drilled 09/09/2020	**Diameter (mm)** 200	**Checked By** KW

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
	HE			▨	SW - Gravelly SAND, fine to medium grained, well graded, brown, with roots, and gravel, concrete, charcoal and brick (FILL).	D	D	no staining, no odour.	
0.05				▨					6.95
0.1				▨					6.9
0.15				▨					6.85
0.2				▨					6.8
0.25				▨					6.75
0.3		2.5	BH410_0.2-0.3	░	SP - SAND, medium to coarse grained, poorly graded, brown, with trace gravel (NATURAL - SOIL).	M	S	no staining, no odour.	6.7
0.35				░					6.65
0.4				░					6.6
0.45				░					6.55
0.5	HA			░					6.5
0.55				░					6.45
0.6		2.2	BH410_0.5-0.6	░					6.4
0.65				░					6.35
0.7				░					6.3
0.75				░					6.25
0.8				░					6.2
0.85				░					6.15
0.9				░					6.1
0.95				░					6.05
1		2.8	BH410_1.0-1.1	░					6
1.05				░					5.95
1.1					Termination Depth at: 1.10 m. Target depth achieved.				5.9
1.15									5.85

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH411

Page 1 of 1

Client Hunter Water Corporation	**Drill Co.** -	**Easting** -33.046463993378
Project Belmont Temporary Desalination Plant Design	**Driller** AB	**Northing** 151.671206261963
Project No. 2219573	**Equipment** 50 mm hand auger	**Grid Ref** GDA94_MGA_zone_55
Site Belmont Temporary Desalination Plant	**Drill Method** HA	**Elevation (m)** 6.0
Location Ocean Park Road, Belmont NSW 2280	**Total Depth (m)** 1.1	**Logged By** AB
Date Drilled 09/09/2020	**Diameter (mm)** 50	**Checked By** KW

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
	HA				SP - SAND, fine to medium grained, poorly graded, brown, with roots (FILL).	D	L	no staining, no odour.	
0.05									5.95
0.1									5.9
0.15									5.85
0.2									5.8
0.25									5.75
0.3		1.6	BH411_0.2-0.3						5.7
0.35									5.65
0.4					SW - Clayey SAND, medium to coarse grained, well graded, dark brown, with gravel (POSSIBLE NATURAL - SOIL).	M	D	no staining, no odour.	5.6
0.45									5.55
0.5									5.5
0.55									5.45
0.6		2.3	BH411_0.5-0.6		SP - SAND, medium to coarse grained, poorly graded, brown, with trace gravel (NATURAL - SOIL).	M	S	no staining, no odour.	5.4
0.65									5.35
0.7									5.3
0.75									5.25
0.8									5.2
0.85									5.15
0.9									5.100
0.95									5.050
1		0.7	BH411_1.0-1.1						5.000
1.05									4.95
1.1					Termination Depth at: 1.10 m. Target depth achieved.				4.9
1.15									4.850

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH412

Page 1 of 1

Client Hunter Water Corporation	**Drill Co.** -	**Easting** -33.0459656473249
Project Belmont Temporary Desalination Plant Design	**Driller** AB	**Northing** 151.671762317419
Project No. 2219573	**Equipment** 50 mm hand auger & LH shovel	**Grid Ref** GDA94_MGA_zone_55
Site Belmont Temporary Desalination Plant	**Drill Method** HE, HA	**Elevation (m)** 6.0
Location Ocean Park Road, Belmont NSW 2280	**Total Depth (m)** 1.1	**Logged By** AB
Date Drilled 09/09/2020	**Diameter (mm)** 200	**Checked By** KW

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
	HE				SW - Gravelly SAND, fine to medium grained, well graded, brown, with roots, and gravel and charcoal (FILL).	D	D	no staining, no odour.	
0.05									5.95
0.1									5.9
0.15									5.85
0.2									5.8
0.25									5.75
0.3		1.7	BH412_0.2-0.3						5.7
	HA				SP - SAND, medium to coarse grained, poorly graded, brown, with trace gravel (NATURAL - SOIL).	M	S	no staining, no odour.	
0.35									5.65
0.4									5.6
0.45									5.55
0.5									5.5
0.55									5.45
0.6		2.2	BH412_0.5-0.6						5.4
0.65									5.35
0.7									5.3
0.75									5.25
0.8									5.2
0.85									5.15
0.9									5.100
0.95									5.050
1		4.6	BH412_1.0-1.1						5.000
1.05									4.95
1.1									4.9
					Termination Depth at: 1.10 m. Target depth achieved.				
1.15									4.850

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

GEO_BOREHOLE 221957302 BELMONT TEMP DP.GPJ GHD_GEO_TEMPLATE.GDT 3/10/18

BOREHOLE LOG SHEET

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. BH301

SHEET 1 OF 1

Position : 376642.0 E 6344656.0 N
Surface RL:
Angle from Horiz. : 90°
Processed : RCO
Rig Type : Hanjin D&B
Mounting: Track
Contractor : Total Drilling Pty Ltd
Driller : M. Sawyer
Checked : AWJ
Date Started : 30/8/2018
Date Completed : 30/8/2018
Logged by : D. Cooper
Date: 20/09/2018

Note: * indicates signatures on original issue of log or last revision of log

DRILLING					MATERIAL						Comments/ Observations
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Description** SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	
0	AD/T	Nil		Dx3 Dx2 Dx3 D			-	FILL, Silty SAND, dark grey, fine to coarse grained, with fine to coarse, sub-rounded to sub-angular gravel, trace coal fragments, (fill). 0.40m, becoming brown, gravel becoming fine to medium.	D D-M	-	
			2.1m	SPT 25 for 20mm N=ref Dx3 D SPT 11/14/14 N=28 D D D	0.70		SW	SAND, grey, fine to coarse grained, (marine/estuarine?).	D-M W	VD MD	
				D SPT 2/4/7 N=11 D	2.70		SM	Silty SAND, dark brown, fine to coarse grained, (marine/estuarine?).	W	MD	
				D D D SPT 3/5/9 N=14 D D	3.50		SW	SAND, grey, fine to coarse grained, trace of silt, (marine/estuarine?).	W	MD	
5					5.00			End of borehole at 5 metres. Target Depth			

Scale: 1, 2, 3, 4, 5, 6, 7, 8

See standard sheets for details of abbreviations & basis of descriptions

GHD GEOTECHNICS
Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle 2300 Australia
T: 61 2 4979 9999 F: 61 2 4979 9988 E: ntlmail@ghd.com
CONSULTING GEOTECHNICAL ENGINEERS AND GEOLOGISTS

Job No.
22-19573

BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

GEO_BOREHOLE 221957302 BELMONT TEMP DP.GPJ GHD_GEO_TEMPLATE.GDT 3/10/18

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont, WWTP, NSW

HOLE No. GW101/BH101

SHEET 1 OF 3

Position : 375613.0 E 6342563.0 N	**Surface RL:**	**Angle from Horiz. :** 90°	**Processed :** MAG
Rig Type : Hanjin D&B **Mounting:** Track	**Contractor :** Total Drilling Pty Ltd	**Driller :** M. Sawyer	**Checked :** AWJ
Date Started : 29/8/2018	**Date Completed :** 29/8/2018	**Logged by :** D. Cooper	**Date:** 20/09/2018

Note: * indicates signatures on original issue of log or last revision of log

DRILLING

SCALE (m)	Drilling Method	Hole Support \ Casing	Water
0–4	AD/T	Nil	▽ 0.95m
4–8	Hollow Flight Auger		

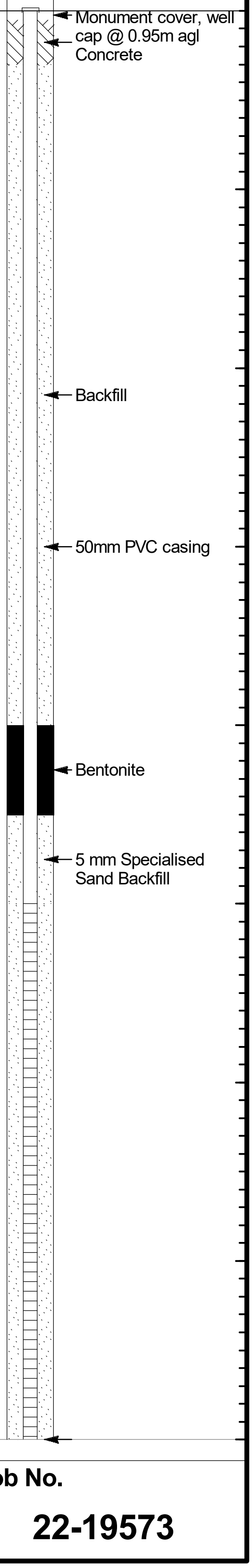
Samples & Tests

Dx3
Dx2
Dx2
D SPT 2/3/4 N=7
Dx2
D SPT 3/3/5 N=8
D
D SPT 3/4/6 N=10
D SPT 6/9/12 N=21
SPT 2/7/10 N=17
D SPT 10/20/25 N=45

MATERIAL

Depth / (RL) metres	USC Symbol	Description: SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Comments/ Observations
0.02	SW	SAND, dark grey, fine to coarse grained, with silt, (topsoil).	D	-	
	SW	SAND, pale yellow brown, fine to coarse grained, (aeolian). 0.49-0.50m, dark grey, silty sand layer. 0.50m, trace fine, sub-rounded gravel.	D-M M	MD	
0.90	SM	Silty SAND, dark grey, fine to coarse grained, (fill/alluvium).	W	-	
1.20	SW	SAND, grey, fine to coarse grained, (marine?).	W	MD D (4.0 m) VD (7.0 m)	

PIEZOMETER



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BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont, WWTP, NSW

HOLE No. GW101/BH101

SHEET 2 OF 3

Position : 375613.0 E 6342563.0 N	**Surface RL:**	**Angle from Horiz. :** 90°	**Processed :** MAG
Rig Type : Hanjin D&B **Mounting:** Track	**Contractor :** Total Drilling Pty Ltd	**Driller :** M. Sawyer	**Checked :** AWJ
Date Started : 29/8/2018	**Date Completed :** 29/8/2018	**Logged by :** D. Cooper	**Date:** 20/09/2018

Note: * indicates signatures on original issue of log or last revision of log

DRILLING					MATERIAL							PIEZOMETER	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Description** SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	**Comments/ Observations**	Piezometer Log	**Components**
	Hollow Flight Auger						SW	SAND, as previous.	W	VD			5 mm Specialised Sand Backfill
9													
10				SPT 8/15/25 for 120mm N=ref									
11													
12													50mm PVC Screen Pipe
13				SPT 5/12/21 N=33									5 mm Specialised Sand Backfill
14													
15													
16													

See standard sheets for details of abbreviations & basis of descriptions

Job No.

22-19573

BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

GEO_BOREHOLE 221957302 BELMONT TEMP DP.GPJ GHD_GEO_TEMPLATE.GDT 3/10/18

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont, WWTP, NSW

HOLE No. GW101/BH101

SHEET 3 OF 3

Position : 375613.0 E 6342563.0 N
Surface RL:
Angle from Horiz. : 90°
Processed : MAG
Rig Type : Hanjin D&B
Mounting: Track
Contractor : Total Drilling Pty Ltd
Driller : M. Sawyer
Checked : AWJ
Date Started : 29/8/2018
Date Completed : 29/8/2018
Logged by : D. Cooper
Date: 20/09/2018

Note: * indicates signatures on original issue of log or last revision of log

DRILLING					MATERIAL							PIEZOMETER	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Description** SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	**Comments/ Observations**	Piezometer Log	**Components**
	Hollow Flight Auger			D SPT 7/16/25 for 135mm N=ref	16.30		SW	SAND, as previous.	W	VD			
17					17.50		SW	SAND, grey, fine to coarse grained, trace clay, (estuarine/marine?).	W	VD			
18 19				D SPT 8/16/25 for 125mm N=ref	20.00		SW	SAND, grey, fine to coarse grained, trace of fine grained, sub-rounded gravel, (marine/estuarine?).	W	VD			5 mm Specialised Sand Backfill Base of piezo @ 20m bgl
20 21 22 23 24								End of borehole at 20 metres.					

See standard sheets for details of abbreviations & basis of descriptions

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BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. GW102/BH102

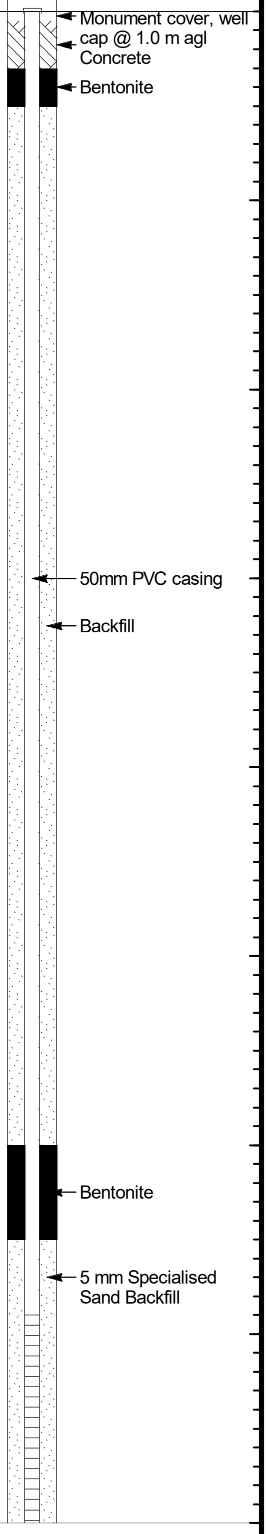
SHEET 1 OF 3

Position : 375661.0 E 6342448.0 N
Surface RL:
Angle from Horiz. : 90°
Processed : MAG
Rig Type : Hanjin D&B
Mounting: Track
Contractor : Total Drilling Pty Ltd
Driller : M. Sawyer
Checked : AWJ
Date Started : 15/8/2018
Date Completed : 15/8/2018
Logged by : D. Cooper
Date: 20/09/2018

Note: * indicates signatures on original issue of log or last revision of log

DRILLING					MATERIAL						
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Comments/ Observations
	AD/T	Nil		Dx3 Dx2 Dx2 D	0.80		-	FILL, SAND, brown to grey, fine to coarse grained, with silt, abundant rootlets, trace plastic(band aid), (fill).	D	-	
1				SPT 2/3/4 N=7 D	1.30		SW	FILL, SAND, pale yellow brown, fine to coarse grained, trace wire, (fill).	D	-	
				D SPT 3/4/5 N=9	1.70		SW	SAND, pale yellow brown, fine to coarse, (aeolian).	D	MD	
2			2.3m	Dx2	2.70		SW	SAND, brown to grey, fine to coarse grained, with silt (alluvium).	M W	MD	
3 4 5 6 7 8	Hollow Flight Auger			SPT 3/3/4 N=7 D SPT 3/5/7 N=12 D SPT 2/3/4 N=7 D SPT 3/13/22 N=35			SW	SAND, grey, fine to coarse grained, trace of shells (marine?).	W	MD MD-D VD	

PIEZOMETER



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BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. GW102/BH102

SHEET 2 OF 3

Position : 375661.0 E 6342448.0 N
Surface RL:
Angle from Horiz. : 90°
Processed : MAG
Rig Type : Hanjin D&B
Mounting: Track
Contractor : Total Drilling Pty Ltd
Driller : M. Sawyer
Checked : AWJ
Date Started : 15/8/2018
Date Completed : 15/8/2018
Logged by : D. Cooper
Date: 20/09/2018

Note: * indicates signatures on original issue of log or last revision of log

DRILLING					MATERIAL							PIEZOMETER	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Description** SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	**Comments/ Observations**	Piezometer Log	**Components**
	Hollow Flight Auger						SW	SAND, as previous.	W	VD			
				D									
9													5 mm Specialised Sand Backfill
10				D SPT 5/13/20 N=33									
11													
				D									
12													
13				SPT 5/20/25 for 110mm N=ref									5 mm Specialised Sand Backfill
14													
													50mm PVC Screen Pipe
				D									
15													
16													

See standard sheets for details of abbreviations & basis of descriptions

Job No.
22-19573

BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. GW102/BH102

SHEET 3 OF 3

Position : 375661.0 E 6342448.0 N
Surface RL:
Angle from Horiz. : 90°
Processed : MAG
Rig Type : Hanjin D&B
Mounting: Track
Contractor : Total Drilling Pty Ltd
Driller : M. Sawyer
Checked : AWJ
Date Started : 15/8/2018
Date Completed : 15/8/2018
Logged by : D. Cooper
Date: 20/09/2018

Note: * indicates signatures on original issue of log or last revision of log

DRILLING					MATERIAL								PIEZOMETER	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Comments/ Observations	Piezometer Log	Components
	Hollow Flight Auger			D SPT 7/18/25 for 90mm N=ref			SW	SAND, as previous.	W	VD			
17													
				D									
18													← 5 mm Specialised Sand Backfill
19				D SPT 14/24/25 for 120mm N=ref	19.00		SW	SAND, pale grey, fine to coarse grained, trace fines (clay), (marine/estuarine?)	W	VD			
20													
21													
22					22.00			End of borehole at 22 metres. Target Depth					← Base of piezo @ 21.9m bgl
23													
24													

See standard sheets for details of abbreviations & basis of descriptions

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22-19573

GEO_BOREHOLE 221957302 BELMONT TEMP DP.GPJ GHD_GEO_TEMPLATE.GDT 3/10/18

GEO_BOREHOLE 221957302 BELMONT TEMP DP.GPJ GHD_GEO_TEMPLATE.GDT 3/10/18

BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. GW103/BH103

SHEET 1 OF 6

Position : 375689.0 E 6342505.0 N		**Surface RL:**		**Angle from Horiz. :** 90°	**Processed :** MAG
Rig Type : Hanjin D&B	**Mounting:** Track	**Contractor :** Total Drilling Pty Ltd		**Driller :** M. Sawyer	**Checked :** AWJ
Date Started : 16/8/2018		**Date Completed :** 16/8/2018		**Logged by :** D. Cooper	**Date:** 20/09/2018

Note: * indicates signatures on original issue of log or last revision of log

DRILLING					MATERIAL							PIEZOMETER	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Description** SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	**Comments/ Observations**	Piezometer Log	**Components**
	AD/T	Nil		Dx3 Dx2			SW	SAND, pale yellow brown, fine to coarse grained, (aeolian).	D	-			Monument cover, well cap @ 0.8m agl Concrete Concrete
1			▽ 1.3m	Dx2 D SPT 2/1/3 N=4 Dx2 D SPT 2/3/3 N=6 Dx2	0.50		SM	Silty SAND, dark grey to brown, fine to coarse grained, organic odour, (alluvium). 0.70m, minor zones of sand, trace of silt.	M W	MD			
2					1.80		SW	SAND, grey fine to coarse grained, (marine?).	W	MD			Backfill 50mm PVC casing
3	Washboring			D SPT 3/5/6 N=11									
4				D SPT 5/8/12 N=20						D			
5													Bentonite
				D SPT 6/9/12 N=21				5.30-5.35m, trace of fine grained, sub-rounded to rounded gravel.					5 mm Specialised Sand Backfill
6													
7				SPT 7/11/17 N=28									
8													

See standard sheets for details of abbreviations & basis of descriptions

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CONSULTING GEOTECHNICAL ENGINEERS AND GEOLOGISTS

Job No.

22-19573

GEO_BOREHOLE 221957302 BELMONT TEMP DP.GPJ GHD_GEO_TEMPLATE.GDT 3/10/18

BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. GW103/BH103

SHEET 2 OF 6

Position : 375689.0 E 6342505.0 N	**Surface RL:**	**Angle from Horiz. :** 90°	**Processed :** MAG
Rig Type : Hanjin D&B **Mounting:** Track	**Contractor :** Total Drilling Pty Ltd	**Driller :** M. Sawyer	**Checked :** AWJ
Date Started : 16/8/2018	**Date Completed :** 16/8/2018	**Logged by :** D. Cooper	**Date:** 20/09/2018

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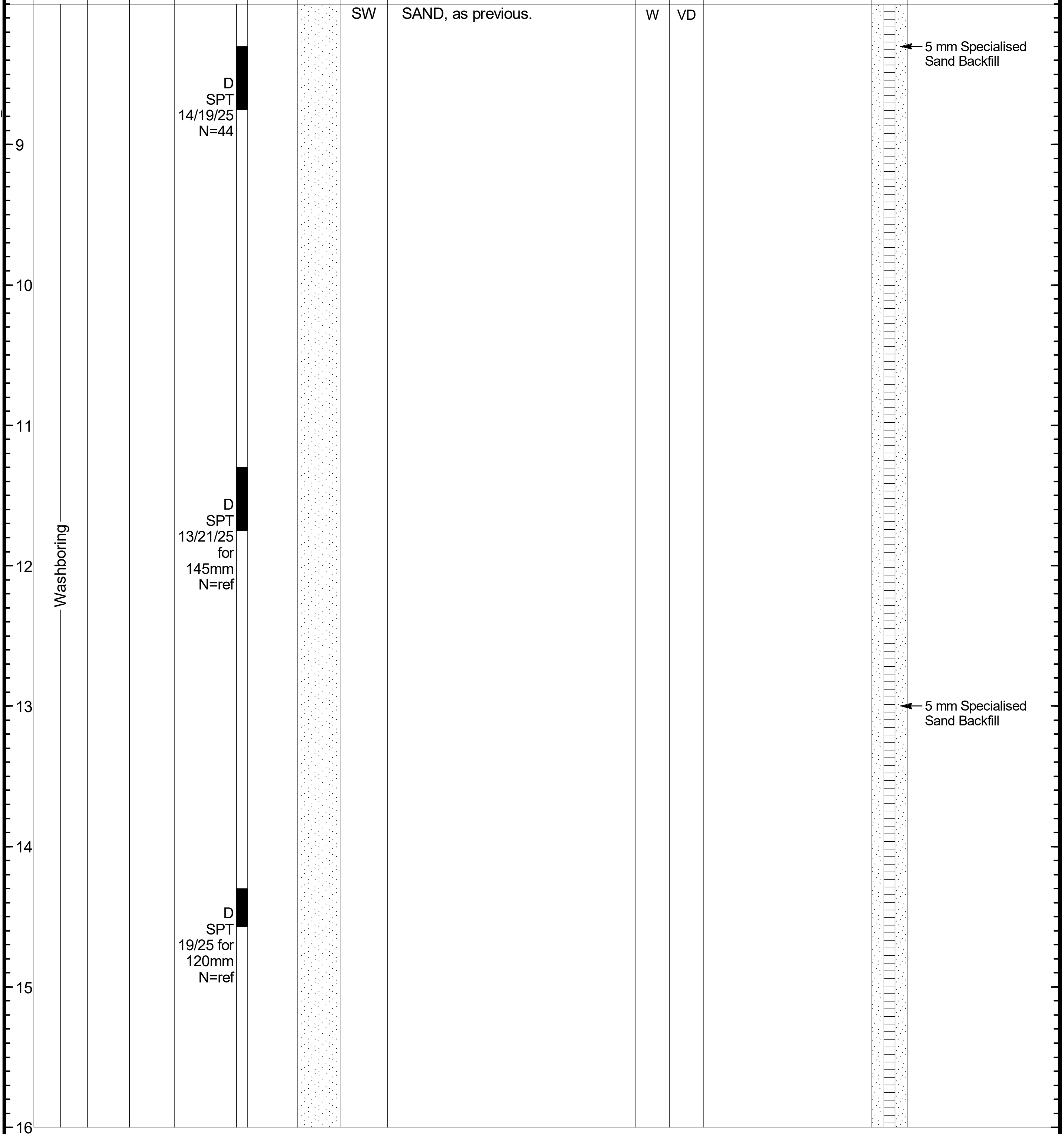

DRILLING					MATERIAL							PIEZOMETER	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Description** SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	**Comments/ Observations**	Piezometer Log	**Components**
	Washboring						SW	SAND, as previous.	W	VD			
													5 mm Specialised Sand Backfill
				D SPT 14/19/25 N=44									
9													
10													
11													
				D SPT 13/21/25 for 145mm N=ref									
12													
13													5 mm Specialised Sand Backfill
14													
				D SPT 19/25 for 120mm N=ref									
15													
16													

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GEO_BOREHOLE 221957302 BELMONT TEMP DP.GPJ GHD_GEO_TEMPLATE.GDT 3/10/18

BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. GW103/BH103

SHEET 3 OF 6

Position : 375689.0 E 6342505.0 N
Surface RL:
Angle from Horiz. : 90°
Processed : MAG
Rig Type : Hanjin D&B
Mounting: Track
Contractor : Total Drilling Pty Ltd
Driller : M. Sawyer
Checked : AWJ
Date Started : 16/8/2018
Date Completed : 16/8/2018
Logged by : D. Cooper
Date: 20/09/2018

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DRILLING					MATERIAL							PIEZOMETER	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Description** SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	**Comments/ Observations**	Piezometer Log	**Components**
	Washboring						SW	SAND, as previous.	W	VD			
17				D SPT 24/25 for 110m N=ref									
18													5 mm Specialised Sand Backfill 50mm PVC Screen Pipe
19													
20													
21													
22													
23													5 mm Specialised Sand Backfill
24													

See standard sheets for details of abbreviations & basis of descriptions

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BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. GW103/BH103

SHEET 4 OF 6

Position : 375689.0 E 6342505.0 N
Surface RL:
Angle from Horiz. : 90°
Processed : MAG
Rig Type : Hanjin D&B
Mounting: Track
Contractor : Total Drilling Pty Ltd
Driller : M. Sawyer
Checked : AWJ
Date Started : 16/8/2018
Date Completed : 16/8/2018
Logged by : D. Cooper
Date: 20/09/2018

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DRILLING					MATERIAL							PIEZOMETER	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Description** SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	**Comments/ Observations**	Piezometer Log	**Components**
	Washboring						SW	SAND, as previous.	W	VD			
25													
26													
27													
28													5 mm Specialised Sand Backfill
29													
30													Base of piezo @ 30.1 mbgl
31					31.00		CI-CH	CLAY, grey, medium to high plasticity (w>PL), trace charcoal, (estaurine?).	M	VSt			
32													

See standard sheets for details of abbreviations & basis of descriptions

Job No.
22-19573

GEO_BOREHOLE 221957302 BELMONT TEMP DP.GPJ GHD_GEO_TEMPLATE.GDT 3/10/18

BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. GW103/BH103

SHEET 5 OF 6

Position : 375689.0 E 6342505.0 N
Surface RL:
Angle from Horiz. : 90°
Processed : MAG
Rig Type : Hanjin D&B
Mounting: Track
Contractor : Total Drilling Pty Ltd
Driller : M. Sawyer
Checked : AWJ
Date Started : 16/8/2018
Date Completed : 16/8/2018
Logged by : D. Cooper
Date: 20/09/2018

Note: * indicates signatures on original issue of log or last revision of log

DRILLING					MATERIAL							PIEZOMETER	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Description** SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	**Comments/ Observations**	Piezometer Log	**Components**
				D SPT 8/12/15 N=27		▨	CI-CH	CLAY, as previous.	M	VSt VSt	PP on SPT sample =320-380 kPa		
33													
34													
35													
36	Washboring												
37													
38													
39													
40													

See standard sheets for details of abbreviations & basis of descriptions

Job No.
22-19573

BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. GW103/BH103

SHEET 6 OF 6

Position : 375689.0 E 6342505.0 N **Surface RL:** **Angle from Horiz. :** 90° **Processed :** MAG
Rig Type : Hanjin D&B **Mounting:** Track **Contractor :** Total Drilling Pty Ltd **Driller :** M. Sawyer **Checked :** AWJ
Date Started : 16/8/2018 **Date Completed :** 16/8/2018 **Logged by :** D. Cooper **Date:** 20/09/2018

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DRILLING					MATERIAL							PIEZOMETER	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Description** SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	**Comments/ Observations**	Piezometer Log	**Components**
	Washboring					▨	CI- CH	CLAY, as previous.	M	VSt VSt			
41					41.10			End of borehole at 41.1 metres. Target Depth					
42													
43													
44													
45													
46													
47													
48													

See standard sheets for details of abbreviations & basis of descriptions

BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. GW104/BH104

SHEET 1 OF 3

Position : 375716.0 E 6342557.0 N
Surface RL:
Angle from Horiz. : 90°
Processed : SBO
Rig Type : Hanjin D&B
Mounting: Track
Contractor : Total Drilling Pty Ltd
Driller : M. Sawyer
Checked : AWJ
Date Started : 31/8/2018
Date Completed : 31/8/2018
Logged by : D. Cooper
Date: 20/09/2018

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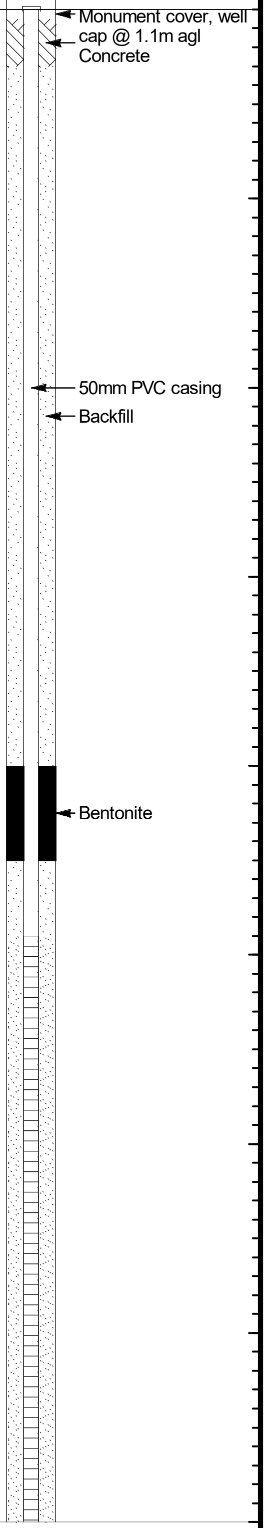
DRILLING

SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests
0–1	AD/T	Nil		Dx3 Dx2 Dx2 D SPT 3/4/6 N=10
1–2			▽ 1.5m	Dx2 D SPT 5/5/5 N=10
2–3				D SPT 3/4/6 N=10
3–4				
4–5	Hollow Flight Auger			D SPT 4/5/7 N=12
5–6				D SPT 4/4/5 N=9
6–7				
7–8				D SPT 3/10/18 N=28

MATERIAL

Depth / (RL) metres	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Comments/ Observations
0.10	-	FILL, Silty SAND, dark grey, fine to coarse grained, (fill).	D	-	
0.70	-	FILL, SAND, brown, fine to coarse grained, trace of silt, (fill).	D	-	
1.70	SW	SAND, pale yellow brown, fine to coarse grained, (aeolian).	D W	MD-D	
2.00	SW	SAND, brown, fine to coarse grained, with silt, (estuarine/marine?).	W	MD-D	
	SW	SAND, grey, fine to coarse grained, trace of silt, trace of fine grained, sub-rounded gravel, (marine?).	W	MD-D	

PIEZOMETER



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GEO_BOREHOLE 221957302 BELMONT TEMP DP.GPJ GHD_GEO_TEMPLATE.GDT 3/10/18

BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. GW104/BH104

SHEET 2 OF 3

Position : 375716.0 E 6342557.0 N		**Surface RL:**		**Angle from Horiz. :** 90°	**Processed :** SBO
Rig Type : Hanjin D&B	**Mounting:** Track	**Contractor :** Total Drilling Pty Ltd		**Driller :** M. Sawyer	**Checked :** AWJ
Date Started : 31/8/2018		**Date Completed :** 31/8/2018		**Logged by :** D. Cooper	**Date:** 20/09/2018

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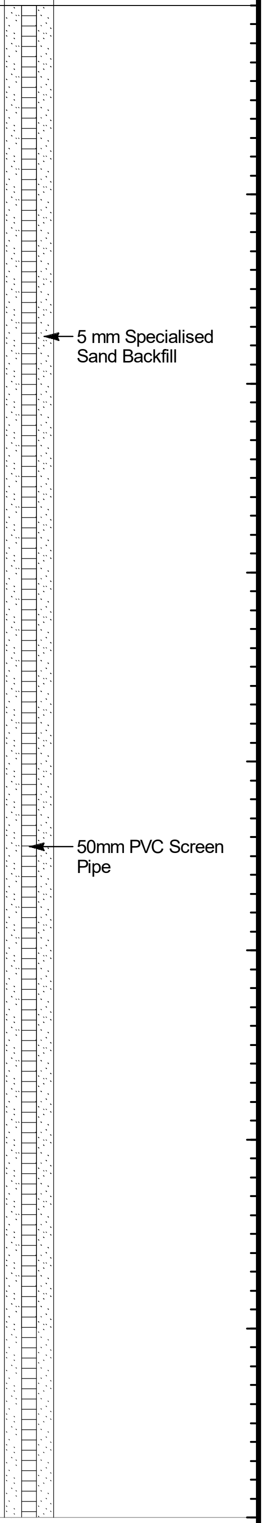
DRILLING					MATERIAL							
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Description** SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	**Comments/ Observations**
	Hollow Flight Auger						SW	SAND, as previous.	W	MD-D	
9											
10				SPT 3/9/14 N=23							
11											
12											
13				SPT 6/15/25 for 140mm N=ref						VD	
14											
15											
16											

PIEZOMETER



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BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. GW104/BH104

SHEET 3 OF 3

Position : 375716.0 E 6342557.0 N	**Surface RL:**	**Angle from Horiz. :** 90°	**Processed :** SBO
Rig Type : Hanjin D&B **Mounting:** Track	**Contractor :** Total Drilling Pty Ltd	**Driller :** M. Sawyer	**Checked :** AWJ
Date Started : 31/8/2018	**Date Completed :** 31/8/2018	**Logged by :** D. Cooper	**Date:** 20/09/2018

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DRILLING					MATERIAL							PIEZOMETER	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Description** SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	**Comments/ Observations**	Piezometer Log	**Components**
	Hollow Flight Auger			SPT 7/9/15 N=24			SW	SAND, as previous.	W	MD-D			
17													
													5 mm Specialised Sand Backfill
18													
19				SPT 10/17/25 for 130mm N=ref						VD			
20					20.00			End of borehole at 20 metres. Target Depth					Base of piezo @ 20.0m
21													
22													
23													
24													

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GEO_BOREHOLE 221957302 BELMONT TEMP DP.GPJ GHD_GEO_TEMPLATE.GDT 3/10/18

BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. GW105/BH105

SHEET 1 OF 3

Position : 375798.0 E 6342432.0 N
Surface RL:
Angle from Horiz. : 90°
Processed : SBO
Rig Type : Hanjin D&B
Mounting: Track
Contractor : Total Drilling Pty Ltd
Driller : M. Sawyer
Checked : AWJ
Date Started : 28/8/2018
Date Completed : 28/8/2018
Logged by : D. Cooper
Date: 20/09/2018

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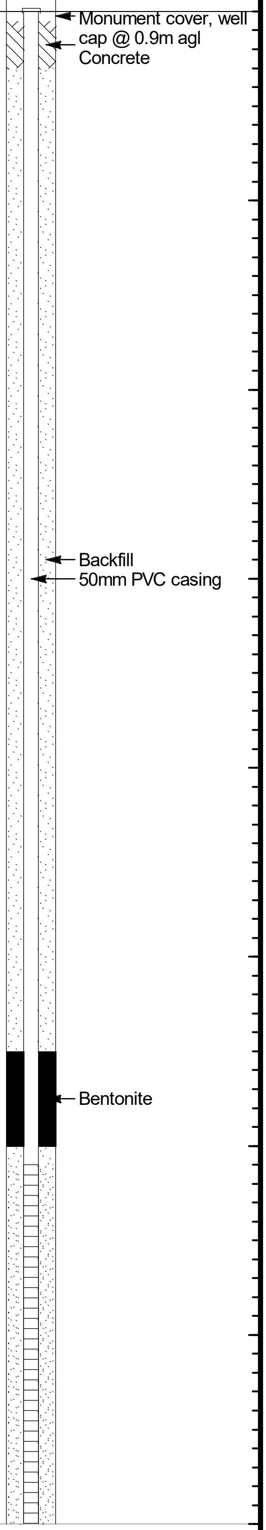
DRILLING					MATERIAL						
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Description** SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	**Comments/ Observations**
							SW	SAND, pale yellow brown, fine to coarse grained, (aeolian).	D	MD	
									M		
1				D SPT 4/5/5 N=10							
				D SPT 3/2/5 N=7							
2											
3				D SPT 3/4/4 N=8							
4	AD/T	Nil	▽ 4.1m						W	L- MD	
				D SPT 2/3/3 N=6							
5											
6				D SPT 2/2/3 N=5							
7				D SPT 2/2/4 N=6				SAND, grey, fine to coarse grained, trace of clayey sand lenses, (marine/estuarine?).			
8											

PIEZOMETER



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BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

GEO_BOREHOLE 221957302 BELMONT TEMP DP.GPJ GHD_GEO_TEMPLATE.GDT 3/10/18

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. GW105/BH105

SHEET 2 OF 3

Position : 375798.0 E 6342432.0 N
Surface RL:
Angle from Horiz. : 90°
Processed : SBO
Rig Type : Hanjin D&B
Mounting: Track
Contractor : Total Drilling Pty Ltd
Driller : M. Sawyer
Checked : AWJ
Date Started : 28/8/2018
Date Completed : 28/8/2018
Logged by : D. Cooper
Date: 20/09/2018

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DRILLING					MATERIAL							PIEZOMETER	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Description** SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	**Comments/ Observations**	Piezometer Log	**Components**
							SW	SAND, as previous.	W				
				D				8.5m, becoming dark grey, trace silt.					
9													
								9.5m, becoming grey, no silt.					5 mm Specialised Sand Backfill
10				D SPT 7/17/25 for 140mm N=ref						VD			
11													
12	AD/T	Nil											
13				SPT 10/19/25 for 100mm N=ref									50mm PVC Screen Pipe
14													
								14.5m, trace of fine grained, sub-rounded to rounded gravel.					5 mm Specialised Sand Backfill
15													
16													

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BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. GW105/BH105

SHEET 3 OF 3

Position : 375798.0 E 6342432.0 N **Surface RL:** **Angle from Horiz. :** 90° **Processed :** SBO
Rig Type : Hanjin D&B **Mounting:** Track **Contractor :** Total Drilling Pty Ltd **Driller :** M. Sawyer **Checked :** AWJ
Date Started : 28/8/2018 **Date Completed :** 28/8/2018 **Logged by :** D. Cooper **Date:** 20/09/2018

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DRILLING					MATERIAL							PIEZOMETER	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Description** SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	**Comments/ Observations**	Piezometer Log	**Components**
				SPT 9/20/25 for 110mm N=ref			SW	SAND, as previous.	W	VD			
17													5 mm Specialised Sand Backfill
18	AD/T	Nil											
19				SPT 6/18/25 for 100mm N=ref									
20					20.50								Base of piezo @ 20.5m
								End of borehole at 20.5 metres. Target Depth					
21													
22													
23													
24													

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BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. GW106/BH106

SHEET 1 OF 3

Position : 375737.0 E 6342369.0 N	**Surface RL:**	**Angle from Horiz. :** 90°	**Processed :** SBO
Rig Type : Hanjin D&B **Mounting:** Track	**Contractor :** Total Drilling Pty Ltd	**Driller :** M. Sawyer	**Checked :** AWJ
Date Started : 27/8/2018	**Date Completed :** 27/8/2018	**Logged by :** D. Cooper	**Date:** 20/09/2018

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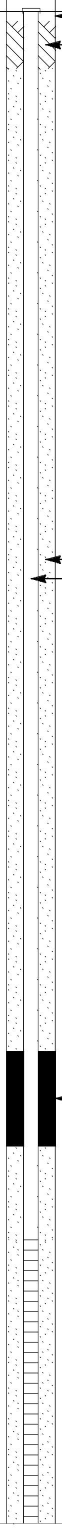

DRILLING					MATERIAL							PIEZOMETER
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Description** SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	**Comments/ Observations**	**Components**
0	AD/T	Nil					SW	SAND, pale yellow brown, fine to coarse grained, (aeolian).	M	MD		Monument cover, well cap @ 1.0m agl Concrete
0.5				D SPT 3/3/3 N=6								
1				D SPT 2/5/4 N=7								
2												
2.5				D SPT 3/4/5 N=9				SAND, grey, fine to coarse grained, (marine?).				Backfill 50mm PVC casing
4				D SPT 1/1/2 N=3								
4.1	Hollow Flight Auger		▽ 4.1m						W	L		
5												
5.5				D SPT 3/3/4 N=7						MD		Bentonite
5.8								5.8m, trace silt/clay.				
6												
7				D SPT 4/7/10 N=17				7.0m, without fines.		D		
8												

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GEO_BOREHOLE 221957302 BELMONT TEMP DP.GPJ GHD_GEO_TEMPLATE.GDT 3/10/18

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. GW106/BH106

SHEET 2 OF 3

Position : 375737.0 E 6342369.0 N	**Surface RL:**	**Angle from Horiz. :** 90°	**Processed :** SBO
Rig Type : Hanjin D&B **Mounting:** Track	**Contractor :** Total Drilling Pty Ltd	**Driller :** M. Sawyer	**Checked :** AWJ
Date Started : 27/8/2018	**Date Completed :** 27/8/2018	**Logged by :** D. Cooper	**Date:** 20/09/2018

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DRILLING					MATERIAL							PIEZOMETER	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Description** SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	**Comments/ Observations**	Piezometer Log	**Components**
	Hollow Flight Auger						SW	SAND, as previous.	W	D			
9													
10				D SPT 4/14/25 for 140mm N=ref			SW	10.0m, trace shell fragments.	W	VD			
11													
12													
13				SPT 9/21/25 for 80mm N=ref									50mm PVC Screen Pipe
14													5 mm Specialised Sand Backfill
15													
16													

See standard sheets for details of abbreviations & basis of descriptions

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BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

GEO_BOREHOLE 221957302 BELMONT TEMP DP.GPJ GHD_GEO_TEMPLATE.GDT 3/10/18

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. GW106/BH106

SHEET 3 OF 3

Position : 375737.0 E 6342369.0 N **Surface RL:** **Angle from Horiz. :** 90° **Processed :** SBO
Rig Type : Hanjin D&B **Mounting:** Track **Contractor :** Total Drilling Pty Ltd **Driller :** M. Sawyer **Checked :** AWJ
Date Started : 27/8/2018 **Date Completed :** 27/8/2018 **Logged by :** D. Cooper **Date:** 20/09/2018

Note: * indicates signatures on original issue of log or last revision of log

DRILLING					MATERIAL							PIEZOMETER	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Description** SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	**Comments/ Observations**	Piezometer Log	**Components**
	Hollow Flight Auger			SPT 8/25 for 135mm N=ref			SW	SAND, as previous.	W	VD			
17													
													5 mm Specialised Sand Backfill
18													
19				SPT 19/25 for 100mm N=ref									
20													
					20.40								
					20.50		CI-CH	CLAY, grey, medium to high plasticity, trace fine to medium grained sand, (estuarine?). End of borehole at 20.5 metres. Target Depth	M	-			Base of piezo @ 20.5m
21													
22													
23													
24													

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GEO_BOREHOLE 221957302 BELMONT TEMP DP.GPJ GHD_GEO_TEMPLATE.GDT 3/10/18

BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. GW107/BH107

SHEET 1 OF 3

Position : 375836.0 E 6342470.0 N
Surface RL:
Angle from Horiz. : 90°
Processed : SBO
Rig Type : Hanjin D&B
Mounting: Track
Contractor : Total Drilling Pty Ltd
Driller : M. Sawyer
Checked : AWJ
Date Started : 24/8/2018
Date Completed : 24/8/2018
Logged by : D. Cooper
Date: 20/09/2018

Note: * indicates signatures on original issue of log or last revision of log

DRILLING					MATERIAL							PIEZOMETER	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Description** SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	**Comments/ Observations**	Piezometer Log	**Components**
0	AD/T	Nil		D SPT 3/5/7 N=12			SW	SAND, yellow-brown, fine to coarse grained (aeolian).	D D-M	D			Monument cover, well cap @ 0.9m agl Concrete
1				D SPT 5/6/8 N=14									
2				D SPT 4/6/7 N=13	2.88		SW	SAND, grey, fine to coarse grained, trace of silt, (marine?).	M				Backfill 50mm PVC casing
3													
4			4.3m	D SPT 3/5/4 N=9					W	MD			
5				D SPT 3/4/5 N=9				5.5m, trace of clayey sand zones, dark grey. 5.8m, becoming yellow brown, trace silt, trace coal/charcoal fragments.					Bentonite 5 mm Specialised Sand Backfill
6													
7				D SPT 2/3/4 N=7				7.0m, becoming pale grey,					
8													

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GEO_BOREHOLE 221957302 BELMONT TEMP DP.GPJ GHD_GEO_TEMPLATE.GDT 3/10/18

BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. GW107/BH107

SHEET 2 OF 3

Position : 375836.0 E 6342470.0 N **Surface RL:** **Angle from Horiz. :** 90° **Processed :** SBO
Rig Type : Hanjin D&B **Mounting:** Track **Contractor :** Total Drilling Pty Ltd **Driller :** M. Sawyer **Checked :** AWJ
Date Started : 24/8/2018 **Date Completed :** 24/8/2018 **Logged by :** D. Cooper **Date:** 20/09/2018

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DRILLING					MATERIAL							PIEZOMETER	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Description** SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	**Comments/ Observations**	Piezometer Log	**Components**
	Hollow Flight Auger						SW	SAND, as previous.	M W	D			
9													
10				D SPT 1/8/19 N=27									
11													
12													
13				D SPT 8/16/25 for 130mm N=ref						VD			50mm PVC Screen Pipe
14													5 mm Specialised Sand Backfill
15													
16													

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BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

GEO_BOREHOLE 221957302 BELMONT TEMP DP.GPJ GHD_GEO_TEMPLATE.GDT 3/10/18

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. GW107/BH107

SHEET 3 OF 3

Position : 375836.0 E 6342470.0 N
Surface RL:
Angle from Horiz. : 90°
Processed : SBO
Rig Type : Hanjin D&B
Mounting: Track
Contractor : Total Drilling Pty Ltd
Driller : M. Sawyer
Checked : AWJ
Date Started : 24/8/2018
Date Completed : 24/8/2018
Logged by : D. Cooper
Date: 20/09/2018

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DRILLING					MATERIAL							PIEZOMETER	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Description** SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	**Comments/ Observations**	Piezometer Log	**Components**
	Hollow Flight Auger			D SPT 7/15/25 for 130mm N=ref			SW	SAND, as previous.	M	VD			
17													
													5 mm Specialised Sand Backfill
18													
19				SPT 3/10/21 N=31									
20					20.10								Base of piezo @ 20.5m bgl
								End of borehole at 20.1 metres. Target Depth					
21													
22													
23													
24													

See standard sheets for details of abbreviations & basis of descriptions

Job No.

22-19573

GEO_BOREHOLE 221957302 BELMONT TEMP DP.GPJ GHD_GEO_TEMPLATE.GDT 3/10/18

BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. GW108/BH108

SHEET 1 OF 3

Position : 375527.0 E 6342625.0 N		**Surface RL:**	**Angle from Horiz. :** 90°		**Processed :** SBO
Rig Type : Hanjin D&B	**Mounting:** Track	**Contractor :** Total Drilling Pty Ltd	**Driller :** M. Sawyer		**Checked :** AWJ
Date Started : 22/8/2018		**Date Completed :** 22/8/2018	**Logged by :** D. Cooper		**Date:** 20/09/2018

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DRILLING					MATERIAL							PIEZOMETER
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	Description SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	Comments/ Observations	Components
0	AD/T	Nil		Dx3 Dx2			-	FILL, Sandy GRAVEL, brown, fine to coarse grained, sub-rounded to sub-angular, sand is fine to to coarse grained, with silt, trace of slag (fill).	D M	-		Monument cover, well cap @ 0.8m agl Concrete
			▽ 0.8m	D SPT 5/6/6 N=12	0.70		SM	SAND, brown, fine to coarse grained, with silt (estuarine?).	M W	MD		
1				D SPT 5/6/8 N=14	1.20		SW	SAND, grey, fine to coarse grained (marine?).	W	- MD		Backfill 50mm PVC casing
2	Hollow Flight Auger											Bentonite
3				D SPT 2/3/3 N=6								5 mm Specialised Sand Backfill
4				D SPT 3/4/5 N=9								
5												
6				D SPT 3/4/7 N=11								
7				D SPT 4/11/16 N=27				7.0m, becoming trace of brown zones, trace silt.		D		
8												

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BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

HOLE No. GW108/BH108

SHEET 2 OF 3

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

Position : 375527.0 E 6342625.0 N	**Surface RL:**	**Angle from Horiz. :** 90°	**Processed :** SBO
Rig Type : Hanjin D&B **Mounting:** Track	**Contractor :** Total Drilling Pty Ltd	**Driller :** M. Sawyer	**Checked :** AWJ
Date Started : 22/8/2018	**Date Completed :** 22/8/2018	**Logged by :** D. Cooper	**Date:** 20/09/2018

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DRILLING					MATERIAL							PIEZOMETER	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Description** SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	**Comments/ Observations**	Piezometer Log	**Components**
	Hollow Flight Auger						SW	SAND, as previous.	W	- D			
9													
10				D SPT 8/13 20 N=33									
					10.20		SW	SAND, brown, fine to coarse grained, trace of silt (marine).	W	D			
11													
													50mm PVC Screen Pipe
					11.90		SW	SAND, grey, fine to coarse grained, (marine).	W	- D			
12													
13				D SPT 6/13/21 N=34									
14													
15													
16													

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BOREHOLE LOG SHEET WITH STANDPIPE PIEZOMETER

Client : Hunter Water Corporation
Project : Belmont Temporary Desalination Plant
Location : Belmont WWTP, NSW

HOLE No. GW108/BH108

SHEET 3 OF 3

Position : 375527.0 E 6342625.0 N		**Surface RL:**		**Angle from Horiz. :** 90°	**Processed :** SBO
Rig Type : Hanjin D&B	**Mounting:** Track	**Contractor :** Total Drilling Pty Ltd		**Driller :** M. Sawyer	**Checked :** AWJ
Date Started : 22/8/2018		**Date Completed :** 22/8/2018		**Logged by :** D. Cooper	**Date:** 20/09/2018

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DRILLING					MATERIAL							PIEZOMETER	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Description** SOIL TYPE, colour, structure, minor components (origin), and ROCK TYPE, colour, grain size, structure, weathering, strength	Moisture Condition	Consistency / Density Index	**Comments/ Observations**	Piezometer Log	**Components**
	Hollow Flight Auger			D SPT 9/22/25 for 105mm N=ref			SW	SAND, as previous. 16.4m, trace of orange-brown clayey sand bands.	W	- VD			
17													
18													
19				D SPT 20/25 for 130mm N=ref	19.23		SW	SAND, grey with black speckles, fine to medium grained, trace of clay, (marine/estuarine?).	W	-			
20					20.50			End of borehole at 20.5 metres. Target Depth					Base of piezo @ 20.5m
21													
22													
23													
24													

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TEST PIT LOG SHEET

Client: Hunter Water Corporation
Project: Belmont Temporary Desalination Plant
Location: Belmont WWTP, NSW

HOLE No. TP101

SHEET 1 **OF** 1

Position: 375615.20 E 6342614.00 N
Surface RL:
Processed: RCO

Method of Exploration: 5T Excavator with 450mm bucket
Hole Size: 4.0 m x 0.45m
Checked: AWJ

Date: 06/09/18
Logged by: D. Cooper
Date: 20/09/2018

Note: * indicates signatures on original issue of log or last revision of log

Scale (m)	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Material Description** [COBBLES / BOULDERS / FILL / TOPSOIL] then SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: Grain size, colour, fabric and texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	**Comments Observations**
		Dx2	0.20		-	FILL, Silty SAND, brown, fine to coarse grained, trace fine to coarse grained, sub-rounded to sub-angular gravel, trace fibro (possible asbestos) fragments, (fill).	D	-	
1	GNE	Dx2 B Dx2	1.40		SP	SAND, yellow brown, fine to coarse grained (aeolian).	D M	VL-L MD	
		D	1.60		SP	SAND, dark grey, fine to coarse grained, with silt (marine?).	M	VL-L	
		B	2.00		SP	SAND, grey, fine to coarse grained (marine?).	M	L-MD	
2 3						End of test pit at 2 metres. Collapsing to 1.50m.			

GEO TEST PIT AS1726 2017 221957302 BELMONT TEMP DP.GPJ GHD GEO TEMPLATE.GDT 3/10/18

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Hunter Water Corporation	job no	22/19573
Belmont Temporary Desalination Plant	file ref	
GEOTECHNICAL INVESTIGATION	scale	N/A
TESTPIT PHOTOGRAPHS – TP101	date	06/09/18

TEST PIT LOG SHEET

Client: Hunter Water Corporation

Project: Belmont Temporary Desalination Plant

Location: Belmont WWTP, NSW

HOLE No. TP102

SHEET 1 **OF** 1

Position: 375602.19 E 6342493.34 N	**Surface RL:**		**Processed:** RCO
Method of Exploration: 5T Excavator with 450mm bucket	**Hole Size:** 4.0 m x 0.45m		**Checked:** AWJ
Date: 06/09/18	**Logged by:** D. Cooper		**Date:** 20/09/2018

Scale (m)	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Material Description** [COBBLES / BOULDERS / FILL / TOPSOIL] then SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: Grain size, colour, fabric and texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Note: * indicates signatures on original issue of log or last revision of log **Comments Observations**
		Dx2	0.20		-	FILL, SAND, brown to grey, fine to coarse grained, with silt (fill/disturbed).	M	-	
		Dx2	0.40		-	FILL, CLAY, brown, low to medium plasticity, with fine to coarse grained sand, abundant rootlets (fill/disturbed).	M	-	
1	▽ 0.8m	B D D D D	2.00		SW	SAND, grey, fine to coarse grained, trace of silt, organic odour (marine?). 0.60m, pale grey, becoming trace of silt. 0.90m, becoming grey. 1.50m, becoming brown to grey.	M W	VL-L L-MD	
2 3						End of test pit at 2 metres. Hole collapsing.			

GEO_TEST PIT_AS1726 2017 221957302 BELMONT TEMP DP.GPJ GHD_GEO_TEMPLATE.GDT 3/10/18

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Hunter Water Corporation
Belmont Temporary Desalination Plant
GEOTECHNICAL INVESTIGATION
TESTPIT PHOTOGRAPHS – TP102

job no	22/19573
file ref	
scale	N/A
date	06/09/18

TEST PIT LOG SHEET

Client: Hunter Water Corporation

Project: Belmont Temporary Desalination Plant

Location: Belmont WWTP, NSW

HOLE No. TP103

SHEET 1 **OF** 1

Position: 375657.00 E 6342523.00 N

Surface RL:

Processed: RCO

Method of Exploration: 5T Excavator with 450mm bucket

Hole Size: 4.0 m x 0.45m

Checked: AWJ

Date: 06/09/18

Logged by: D. Cooper

Date: 20/09/2018

Scale (m)	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Material Description** [COBBLES / BOULDERS / FILL / TOPSOIL] then SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: Grain size, colour, fabric and texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Note: * indicates signatures on original issue of log or last revision of log **Comments Observations**
		Dx2 Dx2	0.50		SW	SAND, pale yellow brown, fine to coarse grained (aeolian).	D M M-W	VL	
		Dx2	0.70		SW	SAND, dark grey to black, fine to coarse grained, with silt, trace clay (estuarine?)	M-W	VL	
1	▽ 1.2m	Dx2 D	1.90		SW	SAND, grey to dark grey, fine to coarse grained, trace of silt.	M-W W	VL L MD	
2 3						End of test pit at 1.9 metres. Hole caving in to 0.50m.			

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Hunter Water Corporation
Belmont Temporary Desalination Plant
GEOTECHNICAL INVESTIGATION
TESTPIT PHOTOGRAPHS – TP103

job no	22/19573
file ref	
scale	N/A
date	06/09/18

Client: Hunter Water Corporation
Project: Belmont Temporary Desalination Plant
Location: Belmont WWTP, NSW

HOLE No. TP104

SHEET 1 **OF** 1

Position: 375609.00 E 6342544.00 N
Surface RL:
Processed: RCO
Method of Exploration: 5T Excavator with 450mm bucket
Hole Size: 4.0 m x 0.45m
Checked: AWJ
Date: 06/09/18
Logged by: D. Cooper
Date: 20/09/2018

Scale (m)	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Material Description** [COBBLES / BOULDERS / FILL / TOPSOIL] then SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: Grain size, colour, fabric and texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Note: * indicates signatures on original issue of log or last revision of log **Comments Observations**
	GNE		0.02		SM	FILL, Silty SAND, dark grey, fine to coarse grained (fill/topsoil).	D	-	
		Dx3 Dx2 B D	0.55		SW	SAND, pale yellow brown, fine to coarse grained (aeolian).	D	VL-L	
1 2		B D D B	2.20		SW	SAND, grey, fine to coarse grained, trace silt, (marine?).	M W	VL-L L-MD MD	
3						End of test pit at 2.2 metres. Hole collapsed to 1.20m.			

Hunter Water Corporation
Belmont Temporary Desalination Plant
GEOTECHNICAL INVESTIGATION
TESTPIT PHOTOGRAPHS – TP104

job no 22/19573
file ref
scale N/A
date 06/09/18

TEST PIT LOG SHEET

Client: Hunter Water Corporation

Project: Belmont Temporary Desalination Plant

Location: Belmont WWTP, NSW

HOLE No. TP105

SHEET 1 **OF** 1

Position:	375683.00 E 6342488.00 N	**Surface RL:**		**Processed:**	RCO
Method of Exploration:	5T Excavator with 450mm bucket	**Hole Size:**	4.0 m x 0.45m	**Checked:**	AWJ
Date:	06/09/18	**Logged by:**	D. Cooper	**Date:**	20/09/2018

Scale (m)	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Material Description** [COBBLES / BOULDERS / FILL / TOPSOIL] then SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: Grain size, colour, fabric and texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Note: * indicates signatures on original issue of log or last revision of log **Comments Observations**
		Dx3 Dx2 B	0.60		SW	SAND, pale yellow brown, fine to coarse grained (aeolian). 0.45m, becoming grey.	D M W	VL	
		Dx2	0.80		SW	SAND, dark grey to black, fine to coarse grained, with silt, trace clay (marine/estuarine?).	W	VL	
1	▽ 1.3m	Dx2 B	1.60		SW	SAND, grey, fine to coarse grained (marine?).	W	VL L L- MD	
2 3						End of test pit at 1.6 metres. Hole collapsing.		MD	

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22-19573

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Hunter Water Corporation
Belmont Temporary Desalination Plant
GEOTECHNICAL INVESTIGATION
TESTPIT PHOTOGRAPHS – TP105

job no	22/19573
file ref	
scale	N/A
date	06/09/18

TEST PIT LOG SHEET

Client: Hunter Water Corporation
Project: Belmont Temporary Desalination Plant
Location: Belmont WWTP, NSW

HOLE No. TP106

SHEET 1 **OF** 1

Position: 375567.00 E 6342433.00 N
Surface RL:
Processed: RCO
Method of Exploration: 5T Excavator with 450mm bucket
Hole Size: 4.0 m x 0.45m
Checked: AWJ
Date: 06/09/18
Logged by: D. Cooper
Date: 20/09/2018

Note: * indicates signatures on original issue of log or last revision of log

Scale (m)	Water	Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	**Material Description** [COBBLES / BOULDERS / FILL / TOPSOIL] then SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: Grain size, colour, fabric and texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	**Comments Observations**
		Dx3 Dx2 D	0.20		-	FILL, Silty SAND, dark grey, fine to coarse grained, with fine to coarse grained, sub-rounded to sub-angular gravel (gravel comprises fragments of asphalt, concrete, bricks and rock) (fill).	D	-	
			0.60		-	FILL, CLAY, mottled orange brown and green, medium plasticity, with fine to coarse, sub-rounded to sub-angular gravel (fill).	D	-	
		Dx2	0.75		-	FILL, SAND, grey to brown, fine to coarse grained, with fine to coarse, sub-rounded to sub-angular gravel, trace cobbles up to 180mm diameter (fill).	D	-	
1		D D B			SW	SAND, pale yellow brown, with brown striations, fine to coarse grained, trace of silt (aeolian).	D-M	VL-L-	
						1.10m, becoming grey.	M	L	
		D				1.25m, becoming yellow brown.			
		B				1.50-1.65m, becoming grey.			
		D	1.80					MD	
2 3						End of test pit at 1.8 metres. Hole collapsing.			

See standard sheets for details of abbreviations & basis of descriptions

GHD GEOTECHNICS
Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle 2300 Australia
T: 61 2 4979 9999 F: 61 2 4979 9988 E: ntlmail@ghd.com
CONSULTING GEOTECHNICAL ENGINEERS AND GEOLOGISTS

Job No.
22-19573

Hunter Water Corporation
Belmont Temporary Desalination Plant
GEOTECHNICAL INVESTIGATION
TESTPIT PHOTOGRAPHS – TP106

job no	22/19573
file ref	
scale	N/A
date	06/09/18

Appendix D – Field and laboratory QA/QC program

Overview

QA and QC practices were applied to data gathering and subsequent sample handling procedures. These were designed to provide control over both field and laboratory operations. Additionally, the analytical laboratories completed their own internal QA procedures (as required by NATA registration) during the analysis of samples. Details of the QA/QC program are described below.

Field QC sampling

All fieldwork was conducted in general accordance with the GHD SOP. The SOP ensures that all samples are collected by a set of uniform and systematic methods.

The SOP describes field activities including:

- Implemented decontamination procedures
- Sample identification procedures
- Information requirements for soil logs
- Chain of Custody information requirements
- Sample duplicate frequency

Field Investigation QA/QC results- Soil

Field QA/QC

Field QA/QC procedures used during the proposal comprised:

- **Blind duplicates:** These are prepared in the field by duplicating the original sample and placing two equivalent portions into two separate containers. The duplicate samples are analysed for the identical set of parameters requested for the corresponding original sample. For the blind duplicate sample pairs, relative percentage differences (RPD) are calculated. Blind duplicates provide an indication of the analytical precision of the proposal laboratory, but may also be affected by factors such as sampling methodology, inherent heterogeneity of the sample medium and different laboratory analytical techniques.

Field QC assessment procedure

Assessment of field QC duplicate samples was undertaken by calculating the Relative Percent Difference (RPD) of duplicate samples. For the purposes of this investigation, an RPD value of 30% for inorganics and 50% for organics has been considered appropriate for the assessment of QC results. A result exceeding this value does not necessarily mean the data is invalid, but rather the impact on the data may need to be assessed.

Across the investigations to date, five intra-laboratory duplicates were analysed by ALS and Eurofins which are NATA accredited for the analysis requested. Duplicates and their primary sample pairs are listed below in Table D-1.

Table D-1 Primary and duplicate sample pairs – Soils

Duplicate type	Primary sample	Duplicate	Parameters
Intra-laboratory duplicate	TP106_0.0-0.2	FD20	TRH, BTEX, PAH, heavy metals
	TP205_0.5-0.6	FD10	
	TP208_0.0-0.1	FD05	
	BH406_0.2-0.3	FD03	
	BH407_0.2-0.3	FD04	Heavy metals

RPDs were calculated for intra-laboratory duplicate samples as part of the QA/QC program. RPDs are presented in Table C, Appendix E. Generally, RPDs were within GHDs nominated range with the exception of:

- TP106_0-0.2/FD20 – nickel (40%)
- TP205/FD01 – arsenic, chromium (III + VI), copper, lead, nickel and zinc (32% - 95%)
- TP208/FD05 – moisture (97%)
- BH407_0.2-0.3 / FD04 – chromium and nickel (38 – 44%)

The sample variability is considered to be the result of heterogeneity within the fill. The higher results have been used for data interpretation.

Based on the RPDs calculated for the field blind duplicates, the results and precision of the data is considered to be of an acceptable quality upon which to draw conclusions as part of this assessment.

Laboratory QA/QC control

Laboratory QA

The analytical laboratories undertook the analyses utilising their own internal procedures and test methods (for which they are NATA accredited) and in accordance with their own quality assurance system which forms part of their NATA accreditation.

Laboratory QC procedures

Laboratory QC procedures typically included analysis of the following:

- **Laboratory duplicate samples**: The analytical laboratory collects duplicate sub-samples from one sample submitted for analytical testing at a rate equivalent to 1 in 20 samples per analytical batch, or one sample per batch if less than twenty samples are analysed in a batch. A laboratory duplicate provides data on analytical batch and the analytical precision (repeatability) of the test result.
- **Spiked samples**: An authentic field sample is spiked by adding an aliquot of known concentration of the target analyte(s) prior to sample extraction and analysis. A spike documents the effect of the sample matrix on the extraction and analytical techniques.
- **Certified reference standards**: A reference standard of known (certified) concentration is analysed along with a batch of samples. The Certified Reference Standard provides an indication of the analytical accuracy of the test method.
- **Surrogate standard/spikes**: These are organic compounds which are similar to the analyte of interest in terms of chemical composition, extractability, and chromatographic conditions (retention time), but which are not normally found in environmental samples. These surrogate compounds are spiked into blanks, standards and samples submitted for organic analyses by gas-chromatographic techniques prior to sample extraction. They provide a means of checking that no gross errors have occurred during any stage of the test method leading to significant analyte loss.

- **Laboratory blank**: Usually an organic or aqueous solution that is as free as possible of analyte of interest to which is added all the reagents, in the same volume, as used in the preparation and subsequent analysis of the samples. The reagent blank is carried through the complete sample preparation procedure and contains the same reagent concentrations in the final solution as in the sample solution used for analysis. The reagent blank is used to correct for possible contamination resulting from the preparation or processing of the sample.

Laboratory QC results are presented in Appendix E.

Methodology used to assess QC results

The results of the field and laboratory QC samples were assessed to determine:

- The quality of the data generated.
- Whether the data meets the objectives of the study.
- Whether the data is acceptable for the intended use.

Laboratory QC assessment procedure

The individual laboratories undertake assessment of laboratory QC internally. Duplicates are assessed by calculating the RPD. Percent Recovery (PR) is used to assess spiked samples and surrogate standards. Acceptable values for RPD and PR can vary depending on the type of analyte tested, concentrations of analytes, and sample matrix.

Certified Reference Standards and Materials are analysed by comparing the test result to the certified concentration plus or minus a certified tolerance. Certified tolerances vary depending on the type of analyte tested and the certified concentration of the analyte.

Laboratory QA/QC results- Soil

The NATA certified laboratory results sheets, as presented in Appendix F, refer to a quality control program comprising the analysis of spikes, blanks and duplicate samples. Generally, the results reported indicate that the laboratory was achieving levels of performance within their recommended control limits during the period when the samples from this program were analysed. The laboratory QA/QC outliers are listed in Table D-2. It is noted that some of the laboratory reports contain results for other areas outside the Site and have not been considered in the exceedance summary table.

Table D-2 Laboratory QA/QC Exceedance Summary - Soils

Batch	Analyte/sample	Issue	Comment
ES1824374	Zinc in anonymous sample (lab ID ES1824297-002)	Matrix spike recovery not determined as background level was greater than or equal to 4x spike level	Zinc present in sample at elevated concentrations more than 4x LOR. This single outlier is not considered to be significant.
ES1825728	PAH, TPH, TRH and BTEXN in BH104_0.0-0.2 and BH104_0.2-0.3	Extraction and analysis undertaken 22-23 days after due date.	Based on laboratory preservation methods, holding time exceedance is not considered significant.
	Total recoverable mercury in BH104_0.0-0.2 and BH104_0.2-0.3	Extraction and analysis undertaken 9-10 days after due date.	Based on laboratory preservation methods, holding time exceedance is not considered significant.

Batch	Analyte/sample	Issue	Comment
ES1826547	pH extraction/ preparation for TP101_0.0-0.2, TP101_0.5-0.6, TP105_0.0-0.2, TP105_0.6-0.7	Extraction undertaken 6 days after due date.	Exceedance not considered significant.
725536	Nickel in anonymous sample (lab ID S20-Jn22527)	RPD (39%) outside of 30% acceptance limit.	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review.
	TRH C15-C28 in anonymous sample (lab ID (S20-Jn23443)	RPD (31%) outside of 30% acceptance limit.	

Based on a review of the laboratory QA/QC data, it is considered that the analytical results are reasonably representative of site conditions at the time of this assessment. Where outliers were noted above, they were considered to be attributed to soil sample heterogeneity.

Appendix E – Results table

							Asbestos		Metals								BTEXN							TRH - NEPM 2013							TRH - NEPM 1999				
				Moisture (%)	pH (lab)	Exchangeable Calcium	Asbestos (Trace)	Asbestos Fibres	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Naphthalene (BTEXN)	F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 (Sum of Total)
				%	pH Units	meq/100g	Fibres	g	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				0.1	0.1	0.1	Yes / No	Yes / No	5	1	2	5	5	0.1	2	5	0.2	0.5	0.5	0.5	0.5	0.5	0.2	10	10	50	50	100	100	50	10	50	100	100	50
NEPM 2013 EIL-Commercial/Industrial (0-2m)									160		420	140	1800		55	360							370												
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil (0-2m)																	75	135	165			180		215			170	1,700	3,300						
NEPM 2013 Table 1A(1) HIL D Comm/Ind									3,000	900	3,600	240,000	1,500	730	6,000	400,000																			
CRC CARE 2011 Soil Direct Contact HSL-D Commercial / Industrial																	430	99,000	27,000			81,000	11,000	26,000		20,000		27,000	38,000						
PFAS NEMP 2.0 2020 Ecological direct exposure																																			
PFAS NEMP 2.0 2020 Ecological indirect exposure																																			
PFAS NEMP 2018 Health Industrial/Commercial																																			
Location Code	**Field ID**	**Date**	**Type**																																
BH101	BH101_0.0-0.2	29/08/2018	Normal	<1.0	-	-	No	No	<5	<1	<2	<5	<5	<0.1	<2	32	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
BH101	BH101_0.45-0.5	29/08/2018	Normal	4.6	-	-	-	-	<5	<1	<2	<5	<5	<0.1	<2	16	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
BH102	BH102_0.0-0.2	17/08/2018	Normal	14.2	-	-	-	-	<5	<1	7	86	36	0.6	<2	106	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<10	<10	<50	<50	420	180	600	<10	<50	240	260	500
BH102	BH102_0.5-0.6	17/08/2018	Normal	9.8	-	-	-	-	<5	<1	2	24	7	0.1	<2	43	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<10	<10	<50	<50	130	<100	130	<10	<50	<100	<100	<50
BH103	BH103_0.0-0.2	17/08/2018	Normal	1.3	-	-	No	No	<5	<1	<2	<5	<5	<0.1	<2	19	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
BH103	BH103_0.5-0.6	17/08/2018	Normal	25.2	-	-	-	-	<5	<1	2	11	<5	<0.1	<2	16	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
BH104	BH104_0.0-0.2	31/07/2018	Normal	3.9	-	-	No	No	<5	<1	5	72	25	0.4	<2	108	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<10	<10	<50	<50	350	140	490	<10	<50	180	240	420
BH104	BH104_0.2-0.3	31/07/2018	Normal	6.2	-	-	-	-	<5	1	7	120	36	0.6	2	166	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<10	<10	<50	<50	600	200	800	<10	<50	340	370	710
BH108	BH108_0.0-0.2	22/08/2018	Normal	-	-	-	No	No	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP101	TP101_0.0-0.2	6/09/2018	Normal	3	6	2.5	-	-	<5	<1	<2	6	6	<0.1	<2	36	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
TP101	TP101_0.5-0.6	6/09/2018	Normal	-	6.5	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP102	TP102_0.0-0.2	6/09/2018	Normal	11	-	-	-	-	<5	<1	4	61	16	0.3	<2	38	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
TP103	TP103_0.0-0.2	6/09/2018	Normal	5.9	-	-	-	-	<5	<1	<2	<5	<5	<0.1	<2	<5	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
TP103	TP103 0.5-0.6	6/09/2018	Normal	28.4	6.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP103	TP103 1.0-1.1	6/09/2018	Normal	14.6	5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP104	TP104_0.0-0.2	6/09/2018	Normal	<1.0	-	-	-	-	<5	<1	<2	10	<5	<0.1	<2	29	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
TP105	TP105_0.0-0.2	6/09/2018	Normal	<1.0	6.6	0.8	-	-	<5	<1	<2	<5	<5	<0.1	<2	21	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
TP105	TP105_0.6-0.7	6/09/2018	Normal	-	6.7	8.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP106	TP106_0.0-0.2	6/09/2018	Normal	14.9	-	-	No	No	25	<1	5	194	246	<0.1	<2	3,130	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
TP106	FD20	6/09/2018	Field_D	13.8	-	-	-	-	20	<1	5	206	287	<0.1	3	3,740	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
HA201	HA201_0.0-0.1	10/06/2020	Normal	9.4	-	-	No	No	2.5	<0.4	<5	<5	5.8	<0.1	<5	17	<0.1	<0.1	<0.1	0.2	<0.2	0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
HA201	HA201_0.2-0.3	10/06/2020	Normal	<1	-	-	-	-	2.8	<0.4	<5	<5	<5	<0.1	<5	<5	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP202	TP202_0.0-0.1	10/06/2020	Normal	18	-	-	No	No	4.0	5.4	27	450	130	2.0	15	730	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	1,100	650	1,750	<20	33	480	780	1,293
TP202	TP202_0.2-0.3	10/06/2020	Normal	18	-	-	-	-	2.1	<0.4	<5	8.6	<5	<0.1	<5	8.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP203	TP203_0.0-0.1	10/06/2020	Normal	14	-	-	No	No	3.3	1.5	11	230	60	1.1	<5	150	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	880	380	1,260	<20	22	460	510	992
TP203	TP203_0.2-0.3	10/06/2020	Normal	1.4	-	-	-	-	<2	<0.4	<5	<5	<5	<0.1	<5	13	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP204	TP204_0.0-0.1	10/06/2020	Normal	22	-	-	Yes	Yes	3.0	3.1	23	370	130	2.3	<5	260	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	51	51	1,000	620	1,671	<20	42	470	730	1,242
TP204	TP204_0.2-0.3	10/06/2020	Normal	8.8	-	-	No	No	<2	<0.4	<5	<5	<5	<0.1	<5	47	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP205	TP205_0.0-0.1	10/06/2020	Normal	5.9	-	-	No	No	5.2	<0.4	<5	10	19	<0.1	<5	170	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP205	TP205_0.5-0.6	10/06/2020	Normal	9.8	-	-	No	No	6.8	<0.4	12	6.9	14	<0.1	<5	100	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	57	<50	<50	57
TP205	FD01	10/06/2020	Field_D	10	-	-	-	-	2.8	<0.4	<5	<5	43	<0.1	<5	56	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP206	TP206_0.0-0.1	10/06/2020	Normal	9	-	-	No	No	2.7	<0.4	<5	<5	<5	<0.1	<5	7.4	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP206	TP206_0.5-0.6	10/06/2020	Normal	11	-	-	-	-	3.3	<0.4	<5	<5	<5	<0.1	<5	8.4	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP207	TP207_0.0-0.1	10/06/2020	Normal	1.3	-	-	No	No	<2	<0.4	<5	<5	<5	<0.1	<5	15	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP207	TP207_0.2-0.3	10/06/2020	Normal	11	-	-	-	-	<2	<0.4	<5	<5	<5	<0.1	<5	<5	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP208	TP208_0.0-0.1	10/06/2020	Normal	2.5	-	-	No	No	<2	<0.4	<5	<5	<5	<0.1	<5	<5	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP208	FD05	10/06/2020	Field_D	7.2	-	-	-	-	<2	<0.4	<5	<5	<5	<0.1	<5	6.0	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP208	TP208_0.2-0.3	10/06/2020	Normal	11	-	-	-	-	<2	<0.4	<5	<5	<5	<0.1	<5	7.3	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH401	BH401_0.2-0.3	8/09/2020	Normal	2.1	-	-	No	No	<2	<0.4	<5	<5	<5	<0.1	<5	8.5	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH401	BH401_0.5-0.6	8/09/2020	Normal	2.1	-	-	-	-	2.7	<0.4	<5	<5	<5	<0.1	<5	5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH402	BH402_0.2-0.3	8/09/2020	Normal	3.5	-	-	No	No	4.2	<0.4	140	8.3	10	<0.1	6	38	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH402	BH402_0.5-0.6	8/09/2020	Normal	4.0	-	-	-	-	4.6	<0.4	9.4	6.9	12	<0.1	<5	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH403	BH403_0.2-0.3	8/09/2020	Normal	6.6	-	-	No	No	2.6	<0.4	<5	11	13	<0.1	<5	87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH403	BH403_0.5-0.6	8/09/2020	Normal	3.4	-	-	-	-	2.1	<0.4	<5	9.2	7.3	<0.1	<5	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH404	BH404_0.2-0.3	8/09/2020	Normal	10	-	-	No	No	4.2	<0.4	6.2	22	21	<0.1	5.1	130	<0.1	<0.1	<0.1	0.7	1.2	1.9	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH404	BH404_0.5-0.6	8/09/2020	Normal	10	-	-	-	-	3.7	<0.4	6.6	24	10	0.1	<5	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH405	BH405_0.2-0.3	8/09/2020	Normal	5.3	-	-	No	No	2.8	<0.4	11	22	10	<0.1	6.7	83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH405	BH405_0.7-0.8	8/09/2020	Normal	5.6	-	-	-	-	4.4	<0.4	11	25	11	<0.1	8.0	89	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH406	BH406_0.2-0.3	8/09/2020	Normal	3.8	-	-	No	No	3.5	<0.4	6.2	17	12	<0.1	<5	110	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	61	<50	61
BH406	FD03	8/09/2020	Field_D	3.6	-	-	-	-	3.4	<0.4	6.2	16	13	<0.1	<5	110	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH406	BH406_0.5-0.6	8/09/2020	Normal	3.4	-	-	-	-	12	<0.4	<5	19	13	<0.1	<5	160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	BH407_0.2-0.3	9/09/2020	Normal	6.7	-	-	No	No	5.8	<0.4	8.3	18	14	<0.1	5.8	91	<0.1	<0.1	<0.1	0.1	0.3	0.4	<0.5	<20	<20	<50	<50	160	<100	160	<20	21	120	70	211
BH407	FD04	9/09/2020	Field_D	7.3	-	-	-	-	5.7	<0.4	13	20	15	<0.1	8.5	110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	BH407_0.5-0.6	9/09/2020	Normal	7.9	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	51	51	300	<100	351	<20	35	240	110	385
BH407	BH407_1.0-1.1	9/09/2020	Normal	3.0	-	-	-	-	2.7	<0.4	<5	<5	<5	<0.1	<5	7.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH408	BH408_0.2-0.3	9/09/2020	Normal	2.1	-	-	No	No	2.1	<0.4	<5	34	24	0.2	<5	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH408	BH408_0.5-0.6	9/09/2020	Normal	<1	-	-	-	-	<2	<0.4	<5	8.9	<5	<0.1	<5	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409	BH409_0.2-0.3	9/09/2020	Normal	1.7	-	-	No	No	<2	<0.4	<5	<5	<5	<0.1	<5	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409	BH409_1.0-1.1	9/09/2020	Normal	3.3	-	-	-	-	<2	<0.4	<5	<5	<5	<0.1	<5	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH410	BH410_0.2-0.3	9/09/2020	Normal	5.0	-	-	No	No	4.3	<0.4	5.9	15	8.2	<0.1	7.8	56	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	110	<100	110	<20	<20	85	<50	85
BH410	BH410_0.5-0.6	9/09/2020	Normal	2.1	-	-	-	-	2.3	<0.4	<5	<5	<5	<0.1	<5	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH411	BH411_0.2-0.3	9/09/2020	Normal	3.4	-	-	No	No	<2	<0.4	<5	6.3	<5	<0.1	<5	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH411	BH411_0.5-0.6	9/09/2020	Normal	3.0	-	-	-	-	<2	<0.4	<5	<5	<5	<0.1	<5	6.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH412	BH412_0.2-0.3	9/09/2020	Normal	4.6	-	-	No	No	3.2	<0.4	<5	11	8.9	<0.1	<5	34	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH412	BH412_0.5-0.6	9/09/2020	Normal	4.4	-	-	-	-	<2	<0.4	<5	7.0	11	<0.1	<5	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH101, BH104	COMP 2 (BH101_0.0-0.2, BH104_0.0-0.2)	30/08/2018	Composite (2 Samples)	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP203, TP204, TP205	COMP 1 (TP203_0.0-0.1, TP204-0.0-0.1 and TP205_0.0-0.1,)	10/06/2020	Composite (3 Samples)	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP206, TP207, TP208	COMP 2 (TP206_0.0-0.1, TP207_0.0-0.1, TP208_0.2-0.3)	10/06/2020	Composite (3 Samples)	6.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA201, TP202, TP206	COMP 3 (HA201_0.2-0.3, TP202_0.2-0.3 and TP206_0.2-0.3)	10/06/2020	Composite (3 Samples)	6.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP203, TP204, TP205	COMP 4 (TP203_0.5-0.6, TP204_0.5-0.6 and TP203_0.5-0.5	10/06/2020	Composite (3 Samples)	6.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH401, BH402, BH403, BH404	COMP 1 (BH401_0.2-0.3, BH402_0.2-0.3, BH403_0.2-0.3 and BH404_0.2-0.3)	9/09/2020	Composite (4 samples)	5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH405, BH406, BH407, BH408	COMP 2 (BH405_0.2-0.3, BH406_0.2-0.3, BH407_0.2-0.3 and BH408_0.2-0.3)	9/09/2020	Composite (4 samples)	4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409, BH410, BH411, BH412	COMP 3 (BH409_0.2-0.3, BH410_0.2-0.3, BH411_0.2-0.3 and BH412_0.2-0.3)	9/09/2020	Composite (4 samples)	3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH402, BH405, BH409, BH412	COMP 4 (BH402_0.5-0.6, BH405_0.7-0.8, BH409_0.5-0.6 and BH412_0.5-0.6)	9/09/2020	Composite (4 samples)	4.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix E
Table A
Soil Analytical Results

				PAHs																			
				Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo[b+j]fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene-PAH	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	Total 8 PAHs (as BaP TEQ)(half LOR) - Lab Calc	Total 8 PAHs (as BaP TEQ)(full LOR) - Lab Calc
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 EIL-Commercial/Industrial (0-2m)																	370						
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil (0-2m)								1.4															
NEPM 2013 Table 1A(1) HIL D Comm/Ind																				4,000	40	40	40
CRC CARE 2011 Soil Direct Contact HSL-D Commercial / Industrial																	11,000						
PFAS NEMP 2.0 2020 Ecological direct exposure																							
PFAS NEMP 2.0 2020 Ecological indirect exposure																							
PFAS NEMP 2018 Health Industrial/Commercial																							
Location Code	**Field ID**	**Date**	**Type**																				
BH101	BH101_0.0-0.2	29/08/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH101	BH101_0.45-0.5	29/08/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH102	BH102_0.0-0.2	17/08/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH102	BH102_0.5-0.6	17/08/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH103	BH103_0.0-0.2	17/08/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH103	BH103_0.5-0.6	17/08/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH104	BH104_0.0-0.2	31/07/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH104	BH104_0.2-0.3	31/07/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH108	BH108_0.0-0.2	22/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP101	TP101_0.0-0.2	6/09/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP101	TP101_0.5-0.6	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP102	TP102_0.0-0.2	6/09/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP103	TP103_0.0-0.2	6/09/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP103	TP103 0.5-0.6	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP103	TP103 1.0-1.1	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP104	TP104_0.0-0.2	6/09/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP105	TP105_0.0-0.2	6/09/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP105	TP105_0.6-0.7	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP106	TP106_0.0-0.2	6/09/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP106	FD20	6/09/2018	Field_D	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
HA201	HA201_0.0-0.1	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
HA201	HA201_0.2-0.3	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP202	TP202_0.0-0.1	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP202	TP202_0.2-0.3	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP203	TP203_0.0-0.1	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP203	TP203_0.2-0.3	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP204	TP204_0.0-0.1	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP204	TP204_0.2-0.3	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP205	TP205_0.0-0.1	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP205	TP205_0.5-0.6	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP205	FD01	10/06/2020	Field_D	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP206	TP206_0.0-0.1	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP206	TP206_0.5-0.6	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP207	TP207_0.0-0.1	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP207	TP207_0.2-0.3	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP208	TP208_0.0-0.1	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP208	FD05	10/06/2020	Field_D	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP208	TP208_0.2-0.3	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH401	BH401_0.2-0.3	8/09/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH401	BH401_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH402	BH402_0.2-0.3	8/09/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH402	BH402_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH403	BH403_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH403	BH403_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH404	BH404_0.2-0.3	8/09/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH404	BH404_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH405	BH405_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH405	BH405_0.7-0.8	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH406	BH406_0.2-0.3	8/09/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH406	FD03	8/09/2020	Field_D	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH406	BH406_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	BH407_0.2-0.3	9/09/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH407	FD04	9/09/2020	Field_D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	BH407_0.5-0.6	9/09/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH407	BH407_1.0-1.1	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH408	BH408_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH408	BH408_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409	BH409_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409	BH409_1.0-1.1	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH410	BH410_0.2-0.3	9/09/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH410	BH410_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH411	BH411_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH411	BH411_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH412	BH412_0.2-0.3	9/09/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH412	BH412_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH101, BH104	COMP 2 (BH101_0.0-0.2, BH104_0.0-0.2)	30/08/2018	Composite (2 Samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP203, TP204, TP205	COMP 1 (TP203_0.0-0.1, TP204-0.0-0.1 and TP205_0.0-0.1,)	10/06/2020	Composite (3 Samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP206, TP207, TP208	COMP 2 (TP206_0.0-0.1, TP207_0.0-0.1, TP208_0.2-0.3)	10/06/2020	Composite (3 Samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA201, TP202, TP206	COMP 3 (HA201_0.2-0.3, TP202_0.2-0.3 and TP206_0.2-0.3)	10/06/2020	Composite (3 Samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP203, TP204, TP205	COMP 4 (TP203_0.5-0.6, TP204_0.5-0.6 and TP203_0.5-0.5	10/06/2020	Composite (3 Samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH401, BH402, BH403, BH404	COMP 1 (BH401_0.2-0.3, BH402_0.2-0.3, BH403_0.2-0.3 and BH404_0.2-0.3)	9/09/2020	Composite (4 samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH405, BH406, BH407, BH408	COMP 2 (BH405_0.2-0.3, BH406_0.2-0.3, BH407_0.2-0.3 and BH408_0.2-0.3)	9/09/2020	Composite (4 samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409, BH410, BH411, BH412	COMP 3 (BH409_0.2-0.3, BH410_0.2-0.3, BH411_0.2-0.3 and BH412_0.2-0.3)	9/09/2020	Composite (4 samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH402, BH405, BH409, BH412	COMP 4 (BH402_0.5-0.6, BH405_0.7-0.8, BH409_0.5-0.6 and BH412_0.5-0.6)	9/09/2020	Composite (4 samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix E
Table A
Soil Analytical Results

Hunter Water Corporation
Belmont Temporary Desalination Plant
Detailed Site Investigation

				OC Pesticides																												PCBs							
				Organochlorine pesticides EPAVic	Other organochlorine pesticides EPAVic	4,4'-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	4,4 DDD	4,4 DDT	DDT+DDE+DDD - Lab Calc	Dieldrin	Endosulfan	Endosulfan I (alpha)	Endosulfan II (beta)	Endosulfan Sulfate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Total)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
LOR				0.1	0.1	0.05	0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.2	1	500	100	500	500	500	500	500	500
NEPM 2013 EIL-Commercial/Industrial (0-2m)																640	640																						
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil (0-2m)																																							
NEPM 2013 Table 1A(1) HIL D Comm/Ind									45		530						3,600						100				50		80	2,500	160								7,000
CRC CARE 2011 Soil Direct Contact HSL-D Commercial / Industrial																																							
PFAS NEMP 2.0 2020 Ecological direct exposure																																							
PFAS NEMP 2.0 2020 Ecological indirect exposure																																							
PFAS NEMP 2018 Health Industrial/Commercial																																							
Location Code	**Field ID**	**Date**	**Type**																																				
BH101	BH101_0.0-0.2	29/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH101	BH101_0.45-0.5	29/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH102	BH102_0.0-0.2	17/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH102	BH102_0.5-0.6	17/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH103	BH103_0.0-0.2	17/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH103	BH103_0.5-0.6	17/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104	BH104_0.0-0.2	31/07/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104	BH104_0.2-0.3	31/07/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH108	BH108_0.0-0.2	22/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP101	TP101_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP101	TP101_0.5-0.6	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP102	TP102_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP103	TP103_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP103	TP103 0.5-0.6	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP103	TP103 1.0-1.1	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP104	TP104_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP105	TP105_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP105	TP105_0.6-0.7	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP106	TP106_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP106	FD20	6/09/2018	Field_D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA201	HA201_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA201	HA201_0.2-0.3	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP202	TP202_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP202	TP202_0.2-0.3	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP203	TP203_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP203	TP203_0.2-0.3	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP204	TP204_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP204	TP204_0.2-0.3	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP205	TP205_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP205	TP205_0.5-0.6	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP205	FD01	10/06/2020	Field_D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP206	TP206_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP206	TP206_0.5-0.6	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP207	TP207_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP207	TP207_0.2-0.3	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP208	TP208_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP208	FD05	10/06/2020	Field_D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP208	TP208_0.2-0.3	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH401	BH401_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH401	BH401_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH402	BH402_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH402	BH402_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH403	BH403_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH403	BH403_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH404	BH404_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH404	BH404_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH405	BH405_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH405	BH405_0.7-0.8	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH406	BH406_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH406	FD03	8/09/2020	Field_D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH406	BH406_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	BH407_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	FD04	9/09/2020	Field_D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	BH407_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	BH407_1.0-1.1	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH408	BH408_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH408	BH408_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409	BH409_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409	BH409_1.0-1.1	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH410	BH410_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH410	BH410_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH411	BH411_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH411	BH411_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH412	BH412_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH412	BH412_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH101, BH104	COMP 2 (BH101_0.0-0.2, BH104_0.0-0.2)	30/08/2018	Composite (2 Samples)	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	<100
TP203, TP204, TP205	COMP 1 (TP203_0.0-0.1, TP204-0.0-0.1 and TP205_0.0-0.1,)	10/06/2020	Composite (3 Samples)	0.32	0.2	<0.05	<0.05	<0.05	0.12	<0.05	0.2	-	-	<0.05	<0.05	<0.05	<0.05	0.12	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<500	<100	<500	<500	<500	<500	<500	<500
TP206, TP207, TP208	COMP 2 (TP206_0.0-0.1, TP207_0.0-0.1, TP208_0.2-0.3)	10/06/2020	Composite (3 Samples)	<0.2	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<500	<100	<500	<500	<500	<500	<500	<500
HA201, TP202, TP206	COMP 3 (HA201_0.2-0.3, TP202_0.2-0.3 and TP206_0.2-0.3)	10/06/2020	Composite (3 Samples)	<0.2	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<500	<100	<500	<500	<500	<500	<500	<500
TP203, TP204, TP205	COMP 4 (TP203_0.5-0.6, TP204_0.5-0.6 and TP203_0.5-0.5	10/06/2020	Composite (3 Samples)	<0.2	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<500	<100	<500	<500	<500	<500	<500	<500
BH401, BH402, BH403, BH404	COMP 1 (BH401_0.2-0.3, BH402_0.2-0.3, BH403_0.2-0.3 and BH404_0.2-0.3)	9/09/2020	Composite (4 samples)	<0.2	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<500	<100	<500	<500	<500	<500	<500	<500
BH405, BH406, BH407, BH408	COMP 2 (BH405_0.2-0.3, BH406_0.2-0.3, BH407_0.2-0.3 and BH408_0.2-0.3)	9/09/2020	Composite (4 samples)	<0.2	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<500	<100	<500	<500	<500	<500	<500	<500
BH409, BH410, BH411, BH412	COMP 3 (BH409_0.2-0.3, BH410_0.2-0.3, BH411_0.2-0.3 and BH412_0.2-0.3)	9/09/2020	Composite (4 samples)	<0.2	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<500	<100	<500	<500	<500	<500	<500	<500
BH402, BH405, BH409, BH412	COMP 4 (BH402_0.5-0.6, BH405_0.7-0.8, BH409_0.5-0.6 and BH412_0.5-0.6)	9/09/2020	Composite (4 samples)	<0.2	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<500	<100	<500	<500	<500	<500	<500	<500

Appendix E
Table A
Soil Analytical Results

				PFAS - Perfluoroalkyl Sulfonic Acids								PFAS - Perfluoroalkyl Carboxylic Acids											PFAS											PFAS - Sums				
				Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorononanesulfonic acid (PFNS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Sum of PFHxS and PFOS	Sum of US EPA PFAS (PFOS + PFOA)*	PFAS (Sum of Total)	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	PFAS (Sum of Total)(WA DER List)
				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
LOR				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NEPM 2013 EIL-Commercial/Industrial (0-2m)																																						
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil (0-2m)																																						
NEPM 2013 Table 1A(1) HIL D Comm/Ind																																						
CRC CARE 2011 Soil Direct Contact HSL-D Commercial / Industrial																																						
PFAS NEMP 2.0 2020 Ecological direct exposure									**1,000**								**10,000**																					
PFAS NEMP 2.0 2020 Ecological indirect exposure									*10*																													
PFAS NEMP 2018 Health Industrial/Commercial																	50,000																		20,000				
Location Code	**Field ID**	**Date**	**Type**																																			
BH101	BH101_0.0-0.2	29/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH101	BH101_0.45-0.5	29/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH102	BH102_0.0-0.2	17/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH102	BH102_0.5-0.6	17/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH103	BH103_0.0-0.2	17/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH103	BH103_0.5-0.6	17/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104	BH104_0.0-0.2	31/07/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104	BH104_0.2-0.3	31/07/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH108	BH108_0.0-0.2	22/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP101	TP101_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP101	TP101_0.5-0.6	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP102	TP102_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP103	TP103_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP103	TP103 0.5-0.6	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP103	TP103 1.0-1.1	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP104	TP104_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP105	TP105_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP105	TP105_0.6-0.7	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP106	TP106_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP106	FD20	6/09/2018	Field_D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA201	HA201_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA201	HA201_0.2-0.3	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP202	TP202_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP202	TP202_0.2-0.3	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP203	TP203_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP203	TP203_0.2-0.3	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP204	TP204_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP204	TP204_0.2-0.3	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP205	TP205_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP205	TP205_0.5-0.6	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP205	FD01	10/06/2020	Field_D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP206	TP206_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP206	TP206_0.5-0.6	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP207	TP207_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP207	TP207_0.2-0.3	10/06/2020	Normal	<!	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
TP208	TP208_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP208	FD05	10/06/2020	Field_D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP208	TP208_0.2-0.3	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH401	BH401_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH401	BH401_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH402	BH402_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH402	BH402_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH403	BH403_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH403	BH403_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH404	BH404_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH404	BH404_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH405	BH405_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH405	BH405_0.7-0.8	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH406	BH406_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH406	FD03	8/09/2020	Field_D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH406	BH406_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	BH407_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	FD04	9/09/2020	Field_D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	BH407_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	BH407_1.0-1.1	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH408	BH408_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH408	BH408_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409	BH409_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409	BH409_1.0-1.1	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH410	BH410_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH410	BH410_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH411	BH411_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH411	BH411_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH412	BH412_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH412	BH412_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH101, BH104	COMP 2 (BH101_0.0-0.2, BH104_0.0-0.2)	30/08/2018	Composite (2 Samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP203, TP204, TP205	COMP 1 (TP203_0.0-0.1, TP204-0.0-0.1 and TP205_0.0-0.1,)	10/06/2020	Composite (3 Samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP206, TP207, TP208	COMP 2 (TP206_0.0-0.1, TP207_0.0-0.1, TP208_0.2-0.3)	10/06/2020	Composite (3 Samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA201, TP202, TP206	COMP 3 (HA201_0.2-0.3, TP202_0.2-0.3 and TP206_0.2-0.3)	10/06/2020	Composite (3 Samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP203, TP204, TP205	COMP 4 (TP203_0.5-0.6, TP204_0.5-0.6 and TP203_0.5-0.5	10/06/2020	Composite (3 Samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH401, BH402, BH403, BH404	COMP 1 (BH401_0.2-0.3, BH402_0.2-0.3, BH403_0.2-0.3 and BH404_0.2-0.3)	9/09/2020	Composite (4 samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH405, BH406, BH407, BH408	COMP 2 (BH405_0.2-0.3, BH406_0.2-0.3, BH407_0.2-0.3 and BH408_0.2-0.3)	9/09/2020	Composite (4 samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409, BH410, BH411, BH412	COMP 3 (BH409_0.2-0.3, BH410_0.2-0.3, BH411_0.2-0.3 and BH412_0.2-0.3)	9/09/2020	Composite (4 samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH402, BH405, BH409, BH412	COMP 4 (BH402_0.5-0.6, BH405_0.7-0.8, BH409_0.5-0.6 and BH412_0.5-0.6)	9/09/2020	Composite (4 samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix E
Table A
Soil Analytical Results

							Asbestos		Metals								BTEXN							TRH - NEPM 2013							TRH - NEPM 1999				
				Moisture (%)	pH (lab)	Exchangeable Calcium	Asbestos (Trace)	Asbestos Fibres	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Naphthalene (BTEXN)	F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 (Sum of Total)
				%	pH Units	meq/100g	Fibres	g	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				0.1	0.1	0.1	Yes / No	Yes / No	5	1	2	5	5	0.1	2	5	0.2	0.5	0.5	0.5	0.5	0.5	0.2	10	10	50	50	100	100	50	10	50	100	100	50
NEPM 2013 EIL-Commercial/Industrial (0-2m)									160		420	140	1800		55	360							370												
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil (0-2m)																	75	135	165			180		215			170	1,700	3,300						
NEPM 2013 Table 1A(1) HIL D Comm/Ind									3,000	900	3,600	240,000	1,500	730	6,000	400,000																			
CRC CARE 2011 Soil Direct Contact HSL-D Commercial / Industrial																	430	99,000	27,000			81,000	11,000	26,000		20,000		27,000	38,000						
PFAS NEMP 2.0 2020 Ecological direct exposure																																			
PFAS NEMP 2.0 2020 Ecological indirect exposure																																			
PFAS NEMP 2018 Health Industrial/Commercial																																			
Location Code	**Field ID**	**Date**	**Type**																																
BH101	BH101_0.0-0.2	29/08/2018	Normal	<1.0	-	-	No	No	<5	<1	<2	<5	<5	<0.1	<2	32	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
BH101	BH101_0.45-0.5	29/08/2018	Normal	4.6	-	-	-	-	<5	<1	<2	<5	<5	<0.1	<2	16	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
BH102	BH102_0.0-0.2	17/08/2018	Normal	14.2	-	-	-	-	<5	<1	7	86	36	0.6	<2	106	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<10	<10	<50	<50	420	180	600	<10	<50	240	260	500
BH102	BH102_0.5-0.6	17/08/2018	Normal	9.8	-	-	-	-	<5	<1	2	24	7	0.1	<2	43	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<10	<10	<50	<50	130	<100	130	<10	<50	<100	<100	<50
BH103	BH103_0.0-0.2	17/08/2018	Normal	1.3	-	-	No	No	<5	<1	<2	<5	<5	<0.1	<2	19	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
BH103	BH103_0.5-0.6	17/08/2018	Normal	25.2	-	-	-	-	<5	<1	2	11	<5	<0.1	<2	16	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
BH104	BH104_0.0-0.2	31/07/2018	Normal	3.9	-	-	No	No	<5	<1	5	72	25	0.4	<2	108	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<10	<10	<50	<50	350	140	490	<10	<50	180	240	420
BH104	BH104_0.2-0.3	31/07/2018	Normal	6.2	-	-	-	-	<5	1	7	120	36	0.6	2	166	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<10	<10	<50	<50	600	200	800	<10	<50	340	370	710
BH108	BH108_0.0-0.2	22/08/2018	Normal	-	-	-	No	No	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP101	TP101_0.0-0.2	6/09/2018	Normal	3	6	2.5	-	-	<5	<1	<2	6	6	<0.1	<2	36	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
TP101	TP101_0.5-0.6	6/09/2018	Normal	-	6.5	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP102	TP102_0.0-0.2	6/09/2018	Normal	11	-	-	-	-	<5	<1	4	61	16	0.3	<2	38	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
TP103	TP103_0.0-0.2	6/09/2018	Normal	5.9	-	-	-	-	<5	<1	<2	<5	<5	<0.1	<2	<5	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
TP103	TP103 0.5-0.6	6/09/2018	Normal	28.4	6.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP103	TP103 1.0-1.1	6/09/2018	Normal	14.6	5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP104	TP104_0.0-0.2	6/09/2018	Normal	<1.0	-	-	-	-	<5	<1	<2	10	<5	<0.1	<2	29	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
TP105	TP105_0.0-0.2	6/09/2018	Normal	<1.0	6.6	0.8	-	-	<5	<1	<2	<5	<5	<0.1	<2	21	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
TP105	TP105_0.6-0.7	6/09/2018	Normal	-	6.7	8.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP106	TP106_0.0-0.2	6/09/2018	Normal	14.9	-	-	No	No	25	<1	5	194	246	<0.1	<2	3,130	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
TP106	FD20	6/09/2018	Field_D	13.8	-	-	-	-	20	<1	5	206	287	<0.1	3	3,740	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
HA201	HA201_0.0-0.1	10/06/2020	Normal	9.4	-	-	No	No	2.5	<0.4	<5	<5	5.8	<0.1	<5	17	<0.1	<0.1	<0.1	0.2	<0.2	0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
HA201	HA201_0.2-0.3	10/06/2020	Normal	<1	-	-	-	-	2.8	<0.4	<5	<5	<5	<0.1	<5	<5	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP202	TP202_0.0-0.1	10/06/2020	Normal	18	-	-	No	No	4.0	5.4	27	450	130	2.0	15	730	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	1,100	650	1,750	<20	33	480	780	1,293
TP202	TP202_0.2-0.3	10/06/2020	Normal	18	-	-	-	-	2.1	<0.4	<5	8.6	<5	<0.1	<5	8.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP203	TP203_0.0-0.1	10/06/2020	Normal	14	-	-	No	No	3.3	1.5	11	230	60	1.1	<5	150	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	880	380	1,260	<20	22	460	510	992
TP203	TP203_0.2-0.3	10/06/2020	Normal	1.4	-	-	-	-	<2	<0.4	<5	<5	<5	<0.1	<5	13	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP204	TP204_0.0-0.1	10/06/2020	Normal	22	-	-	Yes	Yes	3.0	3.1	23	370	130	2.3	<5	260	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	51	51	1,000	620	1,671	<20	42	470	730	1,242
TP204	TP204_0.2-0.3	10/06/2020	Normal	8.8	-	-	No	No	<2	<0.4	<5	<5	<5	<0.1	<5	47	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP205	TP205_0.0-0.1	10/06/2020	Normal	5.9	-	-	No	No	5.2	<0.4	<5	10	19	<0.1	<5	170	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP205	TP205_0.5-0.6	10/06/2020	Normal	9.8	-	-	No	No	6.8	<0.4	12	6.9	14	<0.1	<5	100	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	57	<50	<50	57
TP205	FD01	10/06/2020	Field_D	10	-	-	-	-	2.8	<0.4	<5	<5	43	<0.1	<5	56	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP206	TP206_0.0-0.1	10/06/2020	Normal	9	-	-	No	No	2.7	<0.4	<5	<5	<5	<0.1	<5	7.4	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP206	TP206_0.5-0.6	10/06/2020	Normal	11	-	-	-	-	3.3	<0.4	<5	<5	<5	<0.1	<5	8.4	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP207	TP207_0.0-0.1	10/06/2020	Normal	1.3	-	-	No	No	<2	<0.4	<5	<5	<5	<0.1	<5	15	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP207	TP207_0.2-0.3	10/06/2020	Normal	11	-	-	-	-	<2	<0.4	<5	<5	<5	<0.1	<5	<5	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP208	TP208_0.0-0.1	10/06/2020	Normal	2.5	-	-	No	No	<2	<0.4	<5	<5	<5	<0.1	<5	<5	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP208	FD05	10/06/2020	Field_D	7.2	-	-	-	-	<2	<0.4	<5	<5	<5	<0.1	<5	6.0	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
TP208	TP208_0.2-0.3	10/06/2020	Normal	11	-	-	-	-	<2	<0.4	<5	<5	<5	<0.1	<5	7.3	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH401	BH401_0.2-0.3	8/09/2020	Normal	2.1	-	-	No	No	<2	<0.4	<5	<5	<5	<0.1	<5	8.5	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH401	BH401_0.5-0.6	8/09/2020	Normal	2.1	-	-	-	-	2.7	<0.4	<5	<5	<5	<0.1	<5	5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH402	BH402_0.2-0.3	8/09/2020	Normal	3.5	-	-	No	No	4.2	<0.4	140	8.3	10	<0.1	6	38	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH402	BH402_0.5-0.6	8/09/2020	Normal	4.0	-	-	-	-	4.6	<0.4	9.4	6.9	12	<0.1	<5	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH403	BH403_0.2-0.3	8/09/2020	Normal	6.6	-	-	No	No	2.6	<0.4	<5	11	13	<0.1	<5	87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH403	BH403_0.5-0.6	8/09/2020	Normal	3.4	-	-	-	-	2.1	<0.4	<5	9.2	7.3	<0.1	<5	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH404	BH404_0.2-0.3	8/09/2020	Normal	10	-	-	No	No	4.2	<0.4	6.2	22	21	<0.1	5.1	130	<0.1	<0.1	<0.1	0.7	1.2	1.9	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH404	BH404_0.5-0.6	8/09/2020	Normal	10	-	-	-	-	3.7	<0.4	6.6	24	10	0.1	<5	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH405	BH405_0.2-0.3	8/09/2020	Normal	5.3	-	-	No	No	2.8	<0.4	11	22	10	<0.1	6.7	83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH405	BH405_0.7-0.8	8/09/2020	Normal	5.6	-	-	-	-	4.4	<0.4	11	25	11	<0.1	8.0	89	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH406	BH406_0.2-0.3	8/09/2020	Normal	3.8	-	-	No	No	3.5	<0.4	6.2	17	12	<0.1	<5	110	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	61	<50	61
BH406	FD03	8/09/2020	Field_D	3.6	-	-	-	-	3.4	<0.4	6.2	16	13	<0.1	<5	110	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH406	BH406_0.5-0.6	8/09/2020	Normal	3.4	-	-	-	-	12	<0.4	<5	19	13	<0.1	<5	160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	BH407_0.2-0.3	9/09/2020	Normal	6.7	-	-	No	No	5.8	<0.4	8.3	18	14	<0.1	5.8	91	<0.1	<0.1	<0.1	0.1	0.3	0.4	<0.5	<20	<20	<50	<50	160	<100	160	<20	21	120	70	211
BH407	FD04	9/09/2020	Field_D	7.3	-	-	-	-	5.7	<0.4	13	20	15	<0.1	8.5	110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	BH407_0.5-0.6	9/09/2020	Normal	7.9	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	51	51	300	<100	351	<20	35	240	110	385
BH407	BH407_1.0-1.1	9/09/2020	Normal	3.0	-	-	-	-	2.7	<0.4	<5	<5	<5	<0.1	<5	7.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH408	BH408_0.2-0.3	9/09/2020	Normal	2.1	-	-	No	No	2.1	<0.4	<5	34	24	0.2	<5	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH408	BH408_0.5-0.6	9/09/2020	Normal	<1	-	-	-	-	<2	<0.4	<5	8.9	<5	<0.1	<5	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409	BH409_0.2-0.3	9/09/2020	Normal	1.7	-	-	No	No	<2	<0.4	<5	<5	<5	<0.1	<5	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409	BH409_1.0-1.1	9/09/2020	Normal	3.3	-	-	-	-	<2	<0.4	<5	<5	<5	<0.1	<5	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH410	BH410_0.2-0.3	9/09/2020	Normal	5.0	-	-	No	No	4.3	<0.4	5.9	15	8.2	<0.1	7.8	56	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	110	<100	110	<20	<20	85	<50	85
BH410	BH410_0.5-0.6	9/09/2020	Normal	2.1	-	-	-	-	2.3	<0.4	<5	<5	<5	<0.1	<5	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH411	BH411_0.2-0.3	9/09/2020	Normal	3.4	-	-	No	No	<2	<0.4	<5	6.3	<5	<0.1	<5	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH411	BH411_0.5-0.6	9/09/2020	Normal	3.0	-	-	-	-	<2	<0.4	<5	<5	<5	<0.1	<5	6.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH412	BH412_0.2-0.3	9/09/2020	Normal	4.6	-	-	No	No	3.2	<0.4	<5	11	8.9	<0.1	<5	34	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50
BH412	BH412_0.5-0.6	9/09/2020	Normal	4.4	-	-	-	-	<2	<0.4	<5	7.0	11	<0.1	<5	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH101, BH104	COMP 2 (BH101_0.0-0.2, BH104_0.0-0.2)	30/08/2018	Composite (2 Samples)	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP203, TP204, TP205	COMP 1 (TP203_0.0-0.1, TP204-0.0-0.1 and TP205_0.0-0.1,)	10/06/2020	Composite (3 Samples)	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP206, TP207, TP208	COMP 2 (TP206_0.0-0.1, TP207_0.0-0.1, TP208_0.2-0.3)	10/06/2020	Composite (3 Samples)	6.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA201, TP202, TP206	COMP 3 (HA201_0.2-0.3, TP202_0.2-0.3 and TP206_0.2-0.3)	10/06/2020	Composite (3 Samples)	6.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP203, TP204, TP205	COMP 4 (TP203_0.5-0.6, TP204_0.5-0.6 and TP203_0.5-0.5	10/06/2020	Composite (3 Samples)	6.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH401, BH402, BH403, BH404	COMP 1 (BH401_0.2-0.3, BH402_0.2-0.3, BH403_0.2-0.3 and BH404_0.2-0.3)	9/09/2020	Composite (4 samples)	5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH405, BH406, BH407, BH408	COMP 2 (BH405_0.2-0.3, BH406_0.2-0.3, BH407_0.2-0.3 and BH408_0.2-0.3)	9/09/2020	Composite (4 samples)	4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409, BH410, BH411, BH412	COMP 3 (BH409_0.2-0.3, BH410_0.2-0.3, BH411_0.2-0.3 and BH412_0.2-0.3)	9/09/2020	Composite (4 samples)	3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH402, BH405, BH409, BH412	COMP 4 (BH402_0.5-0.6, BH405_0.7-0.8, BH409_0.5-0.6 and BH412_0.5-0.6)	9/09/2020	Composite (4 samples)	4.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix E
Table A
Soil Analytical Results

				PAHs																			
				Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo[b+j]fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene-PAH	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	Total 8 PAHs (as BaP TEQ)(half LOR) - Lab Calc	Total 8 PAHs (as BaP TEQ)(full LOR) - Lab Calc
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 EIL-Commercial/Industrial (0-2m)																	370						
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil (0-2m)								1.4															
NEPM 2013 Table 1A(1) HIL D Comm/Ind																				4,000	40	40	40
CRC CARE 2011 Soil Direct Contact HSL-D Commercial / Industrial																	11,000						
PFAS NEMP 2.0 2020 Ecological direct exposure																							
PFAS NEMP 2.0 2020 Ecological indirect exposure																							
PFAS NEMP 2018 Health Industrial/Commercial																							
Location Code	**Field ID**	**Date**	**Type**																				
BH101	BH101_0.0-0.2	29/08/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH101	BH101_0.45-0.5	29/08/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH102	BH102_0.0-0.2	17/08/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH102	BH102_0.5-0.6	17/08/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH103	BH103_0.0-0.2	17/08/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH103	BH103_0.5-0.6	17/08/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH104	BH104_0.0-0.2	31/07/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH104	BH104_0.2-0.3	31/07/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH108	BH108_0.0-0.2	22/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP101	TP101_0.0-0.2	6/09/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP101	TP101_0.5-0.6	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP102	TP102_0.0-0.2	6/09/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP103	TP103_0.0-0.2	6/09/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP103	TP103 0.5-0.6	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP103	TP103 1.0-1.1	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP104	TP104_0.0-0.2	6/09/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP105	TP105_0.0-0.2	6/09/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP105	TP105_0.6-0.7	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP106	TP106_0.0-0.2	6/09/2018	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP106	FD20	6/09/2018	Field_D	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
HA201	HA201_0.0-0.1	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
HA201	HA201_0.2-0.3	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP202	TP202_0.0-0.1	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP202	TP202_0.2-0.3	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP203	TP203_0.0-0.1	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP203	TP203_0.2-0.3	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP204	TP204_0.0-0.1	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP204	TP204_0.2-0.3	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP205	TP205_0.0-0.1	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP205	TP205_0.5-0.6	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP205	FD01	10/06/2020	Field_D	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP206	TP206_0.0-0.1	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP206	TP206_0.5-0.6	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP207	TP207_0.0-0.1	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP207	TP207_0.2-0.3	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP208	TP208_0.0-0.1	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP208	FD05	10/06/2020	Field_D	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
TP208	TP208_0.2-0.3	10/06/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH401	BH401_0.2-0.3	8/09/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH401	BH401_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH402	BH402_0.2-0.3	8/09/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH402	BH402_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH403	BH403_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH403	BH403_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH404	BH404_0.2-0.3	8/09/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH404	BH404_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH405	BH405_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH405	BH405_0.7-0.8	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH406	BH406_0.2-0.3	8/09/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH406	FD03	8/09/2020	Field_D	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH406	BH406_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	BH407_0.2-0.3	9/09/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH407	FD04	9/09/2020	Field_D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	BH407_0.5-0.6	9/09/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH407	BH407_1.0-1.1	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH408	BH408_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH408	BH408_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409	BH409_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409	BH409_1.0-1.1	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH410	BH410_0.2-0.3	9/09/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH410	BH410_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH411	BH411_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH411	BH411_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH412	BH412_0.2-0.3	9/09/2020	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2
BH412	BH412_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH101, BH104	COMP 2 (BH101_0.0-0.2, BH104_0.0-0.2)	30/08/2018	Composite (2 Samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP203, TP204, TP205	COMP 1 (TP203_0.0-0.1, TP204-0.0-0.1 and TP205_0.0-0.1,)	10/06/2020	Composite (3 Samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP206, TP207, TP208	COMP 2 (TP206_0.0-0.1, TP207_0.0-0.1, TP208_0.2-0.3)	10/06/2020	Composite (3 Samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA201, TP202, TP206	COMP 3 (HA201_0.2-0.3, TP202_0.2-0.3 and TP206_0.2-0.3)	10/06/2020	Composite (3 Samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP203, TP204, TP205	COMP 4 (TP203_0.5-0.6, TP204_0.5-0.6 and TP203_0.5-0.5	10/06/2020	Composite (3 Samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH401, BH402, BH403, BH404	COMP 1 (BH401_0.2-0.3, BH402_0.2-0.3, BH403_0.2-0.3 and BH404_0.2-0.3)	9/09/2020	Composite (4 samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH405, BH406, BH407, BH408	COMP 2 (BH405_0.2-0.3, BH406_0.2-0.3, BH407_0.2-0.3 and BH408_0.2-0.3)	9/09/2020	Composite (4 samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409, BH410, BH411, BH412	COMP 3 (BH409_0.2-0.3, BH410_0.2-0.3, BH411_0.2-0.3 and BH412_0.2-0.3)	9/09/2020	Composite (4 samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH402, BH405, BH409, BH412	COMP 4 (BH402_0.5-0.6, BH405_0.7-0.8, BH409_0.5-0.6 and BH412_0.5-0.6)	9/09/2020	Composite (4 samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix E
Table A
Soil Analytical Results

				OC Pesticides																												PCBs							
				Organochlorine pesticides EPAVic	Other organochlorine pesticides EPAVic	4,4'-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	4,4 DDD	4,4 DDT	DDT+DDE+DDD - Lab Calc	Dieldrin	Endosulfan	Endosulfan I (alpha)	Endosulfan II (beta)	Endosulfan Sulfate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Total)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
LOR				0.1	0.1	0.05	0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.2	1	500	100	500	500	500	500	500	500
NEPM 2013 EIL-Commercial/Industrial (0-2m)																640	640																						
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil (0-2m)																																							
NEPM 2013 Table 1A(1) HIL D Comm/Ind									45		530						3,600						100				50		80	2,500	160								7,000
CRC CARE 2011 Soil Direct Contact HSL-D Commercial / Industrial																																							
PFAS NEMP 2.0 2020 Ecological direct exposure																																							
PFAS NEMP 2.0 2020 Ecological indirect exposure																																							
PFAS NEMP 2018 Health Industrial/Commercial																																							
Location Code	**Field ID**	**Date**	**Type**																																				
BH101	BH101_0.0-0.2	29/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH101	BH101_0.45-0.5	29/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH102	BH102_0.0-0.2	17/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH102	BH102_0.5-0.6	17/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH103	BH103_0.0-0.2	17/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH103	BH103_0.5-0.6	17/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104	BH104_0.0-0.2	31/07/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104	BH104_0.2-0.3	31/07/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH108	BH108_0.0-0.2	22/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP101	TP101_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP101	TP101_0.5-0.6	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP102	TP102_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP103	TP103_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP103	TP103 0.5-0.6	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP103	TP103 1.0-1.1	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP104	TP104_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP105	TP105_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP105	TP105_0.6-0.7	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP106	TP106_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP106	FD20	6/09/2018	Field_D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA201	HA201_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA201	HA201_0.2-0.3	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP202	TP202_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP202	TP202_0.2-0.3	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP203	TP203_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP203	TP203_0.2-0.3	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP204	TP204_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP204	TP204_0.2-0.3	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP205	TP205_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP205	TP205_0.5-0.6	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP205	FD01	10/06/2020	Field_D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP206	TP206_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP206	TP206_0.5-0.6	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP207	TP207_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP207	TP207_0.2-0.3	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP208	TP208_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP208	FD05	10/06/2020	Field_D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP208	TP208_0.2-0.3	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH401	BH401_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH401	BH401_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH402	BH402_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH402	BH402_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH403	BH403_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH403	BH403_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH404	BH404_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH404	BH404_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH405	BH405_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH405	BH405_0.7-0.8	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH406	BH406_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH406	FD03	8/09/2020	Field_D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH406	BH406_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	BH407_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	FD04	9/09/2020	Field_D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	BH407_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	BH407_1.0-1.1	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH408	BH408_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH408	BH408_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409	BH409_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409	BH409_1.0-1.1	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH410	BH410_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH410	BH410_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH411	BH411_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH411	BH411_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH412	BH412_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH412	BH412_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH101, BH104	COMP 2 (BH101_0.0-0.2, BH104_0.0-0.2)	30/08/2018	Composite (2 Samples)	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	<100
TP203, TP204, TP205	COMP 1 (TP203_0.0-0.1, TP204-0.0-0.1 and TP205_0.0-0.1,)	10/06/2020	Composite (3 Samples)	0.32	0.2	<0.05	<0.05	<0.05	0.12	<0.05	0.2	-	-	<0.05	<0.05	<0.05	<0.05	0.12	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<500	<100	<500	<500	<500	<500	<500	<500
TP206, TP207, TP208	COMP 2 (TP206_0.0-0.1, TP207_0.0-0.1, TP208_0.2-0.3)	10/06/2020	Composite (3 Samples)	<0.2	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<500	<100	<500	<500	<500	<500	<500	<500
HA201, TP202, TP206	COMP 3 (HA201_0.2-0.3, TP202_0.2-0.3 and TP206_0.2-0.3)	10/06/2020	Composite (3 Samples)	<0.2	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<500	<100	<500	<500	<500	<500	<500	<500
TP203, TP204, TP205	COMP 4 (TP203_0.5-0.6, TP204_0.5-0.6 and TP203_0.5-0.5	10/06/2020	Composite (3 Samples)	<0.2	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<500	<100	<500	<500	<500	<500	<500	<500
BH401, BH402, BH403, BH404	COMP 1 (BH401_0.2-0.3, BH402_0.2-0.3, BH403_0.2-0.3 and BH404_0.2-0.3)	9/09/2020	Composite (4 samples)	<0.2	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<500	<100	<500	<500	<500	<500	<500	<500
BH405, BH406, BH407, BH408	COMP 2 (BH405_0.2-0.3, BH406_0.2-0.3, BH407_0.2-0.3 and BH408_0.2-0.3)	9/09/2020	Composite (4 samples)	<0.2	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<500	<100	<500	<500	<500	<500	<500	<500
BH409, BH410, BH411, BH412	COMP 3 (BH409_0.2-0.3, BH410_0.2-0.3, BH411_0.2-0.3 and BH412_0.2-0.3)	9/09/2020	Composite (4 samples)	<0.2	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<500	<100	<500	<500	<500	<500	<500	<500
BH402, BH405, BH409, BH412	COMP 4 (BH402_0.5-0.6, BH405_0.7-0.8, BH409_0.5-0.6 and BH412_0.5-0.6)	9/09/2020	Composite (4 samples)	<0.2	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<500	<100	<500	<500	<500	<500	<500	<500

Appendix E
Table A
Soil Analytical Results

				PFAS - Perfluoroalkyl Sulfonic Acids								PFAS - Perfluoroalkyl Carboxylic Acids											PFAS											PFAS - Sums				
				Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorononanesulfonic acid (PFNS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Sum of PFHxS and PFOS	Sum of US EPA PFAS (PFOS + PFOA)*	PFAS (Sum of Total)	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	PFAS (Sum of Total)(WA DER List)
				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
LOR				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NEPM 2013 EIL-Commercial/Industrial (0-2m)																																						
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil (0-2m)																																						
NEPM 2013 Table 1A(1) HIL D Comm/Ind																																						
CRC CARE 2011 Soil Direct Contact HSL-D Commercial / Industrial																																						
PFAS NEMP 2.0 2020 Ecological direct exposure									**1,000**							**10,000**																						
PFAS NEMP 2.0 2020 Ecological indirect exposure									*10*																													
PFAS NEMP 2018 Health Industrial/Commercial																50,000																		20,000				
Location Code	**Field ID**	**Date**	**Type**																																			
BH101	BH101_0.0-0.2	29/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH101	BH101_0.45-0.5	29/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH102	BH102_0.0-0.2	17/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH102	BH102_0.5-0.6	17/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH103	BH103_0.0-0.2	17/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH103	BH103_0.5-0.6	17/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104	BH104_0.0-0.2	31/07/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104	BH104_0.2-0.3	31/07/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH108	BH108_0.0-0.2	22/08/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP101	TP101_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP101	TP101_0.5-0.6	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP102	TP102_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP103	TP103_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP103	TP103 0.5-0.6	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP103	TP103 1.0-1.1	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP104	TP104_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP105	TP105_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP105	TP105_0.6-0.7	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP106	TP106_0.0-0.2	6/09/2018	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP106	FD20	6/09/2018	Field_D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA201	HA201_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA201	HA201_0.2-0.3	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP202	TP202_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP202	TP202_0.2-0.3	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP203	TP203_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP203	TP203_0.2-0.3	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP204	TP204_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP204	TP204_0.2-0.3	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP205	TP205_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP205	TP205_0.5-0.6	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP205	FD01	10/06/2020	Field_D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP206	TP206_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP206	TP206_0.5-0.6	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP207	TP207_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP207	TP207_0.2-0.3	10/06/2020	Normal	<!	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
TP208	TP208_0.0-0.1	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP208	FD05	10/06/2020	Field_D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP208	TP208_0.2-0.3	10/06/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH401	BH401_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH401	BH401_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH402	BH402_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH402	BH402_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH403	BH403_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH403	BH403_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH404	BH404_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH404	BH404_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH405	BH405_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH405	BH405_0.7-0.8	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH406	BH406_0.2-0.3	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH406	FD03	8/09/2020	Field_D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH406	BH406_0.5-0.6	8/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	BH407_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	FD04	9/09/2020	Field_D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	BH407_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH407	BH407_1.0-1.1	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH408	BH408_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH408	BH408_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409	BH409_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409	BH409_1.0-1.1	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH410	BH410_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH410	BH410_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH411	BH411_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH411	BH411_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH412	BH412_0.2-0.3	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH412	BH412_0.5-0.6	9/09/2020	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH101, BH104	COMP 2 (BH101_0.0-0.2, BH104_0.0-0.2)	30/08/2018	Composite (2 Samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP203, TP204, TP205	COMP 1 (TP203_0.0-0.1, TP204-0.0-0.1 and TP205_0.0-0.1,)	10/06/2020	Composite (3 Samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP206, TP207, TP208	COMP 2 (TP206_0.0-0.1, TP207_0.0-0.1, TP208_0.2-0.3)	10/06/2020	Composite (3 Samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA201, TP202, TP206	COMP 3 (HA201_0.2-0.3, TP202_0.2-0.3 and TP206_0.2-0.3)	10/06/2020	Composite (3 Samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP203, TP204, TP205	COMP 4 (TP203_0.5-0.6, TP204_0.5-0.6 and TP203_0.5-0.5	10/06/2020	Composite (3 Samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH401, BH402, BH403, BH404	COMP 1 (BH401_0.2-0.3, BH402_0.2-0.3, BH403_0.2-0.3 and BH404_0.2-0.3)	9/09/2020	Composite (4 samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH405, BH406, BH407, BH408	COMP 2 (BH405_0.2-0.3, BH406_0.2-0.3, BH407_0.2-0.3 and BH408_0.2-0.3)	9/09/2020	Composite (4 samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409, BH410, BH411, BH412	COMP 3 (BH409_0.2-0.3, BH410_0.2-0.3, BH411_0.2-0.3 and BH412_0.2-0.3)	9/09/2020	Composite (4 samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH402, BH405, BH409, BH412	COMP 4 (BH402_0.5-0.6, BH405_0.7-0.8, BH409_0.5-0.6 and BH412_0.5-0.6)	9/09/2020	Composite (4 samples)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix E
Table C
QA/QC

					Metals								BTEXN						
				Moisture (%)	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Naphthalene (BTEXN)
				%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				0.1	5	1	2	5	5	0.1	2	5	0.2	0.5	0.5	0.5	0.5	0.5	0.2
NEPM 2013 EIL-Commercial/Industrial (0-2m)					160		250	95	1100		30	230							170
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil (0-2m)													75	135	165			180	
NEPM 2013 Table 1A(1) HIL D Comm/Ind					3,000	900	3,600	240,000	1,500	730	6,000	400,000							
CRC CARE 2011 Soil Direct Contact HSL-D Commercial / Industrial													430	99,000	27,000			81,000	11,000
PFAS NEMP 2.0 2020 Ecological direct exposure																			
PFAS NEMP 2.0 2020 Ecological indirect exposure																			
PFAS NEMP 2018 Health Industrial/Commercial																			
Duplicates QA/QC																			
Location Code	**Field ID**	**Date**	**Type**																
TP106	TP106_0.0-0.2	6/09/2018	Normal	14.9	25	<1	5	194	246	<0.1	<2	3,130	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP106	FD20	6/09/2018	Field_D	13.8	20	<1	5	206	287	<0.1	3	3,740	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-
	RPD (%)			8	22	NC	0	6	15	NC	***40***	18	NC	NC	NC	NC	NC	NC	-
TP205	TP205_0.5-0.6	10/06/2020	Normal	10	6.8	<0.4	12	6.9	14	<0.1	<5	100	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
TP205	FD01	10/06/2020	Field_D	9	2.8	<0.4	<5	<5	43	<0.1	<5	56	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
	RPD (%)			***11***	***83***	NC	***82***	***32***	***95***	NC	NC	***56***	NC	NC	NC	NC	NC	NC	NC
TP208	TP208_0.0-0.1	10/06/2020	Normal	2.5	<2	<0.4	<5	<5	<5	<0.1	<5	<5	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
TP208	FD05	10/06/2020	Field_D	7.2	<2	<0.4	<5	<5	<5	<0.1	<5	6.0	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
	RPD (%)			97	NC	NC	NC	NC	NC	NC	NC	18	NC	NC	NC	NC	NC	NC	NC
BH406	BH406_0.2-0.3	8/09/2020	Normal	3.8	3.5	<0.4	6.2	17	12	<0.1	<5	110	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
BH406	FD03	8/09/2020	Field_D	3.6	3.4	<0.4	6.2	16	13	<0.1	<5	110	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
	RPD (%)			5	3	NC	0	6	8	NC	NC	0	NC	NC	NC	NC	NC	NC	NC
BH407	BH407_0.2-0.3	9/09/2020	Normal	6.7	5.8	<0.4	8.3	18	14	<0.1	5.8	91	<0.1	<0.1	<0.1	0.1	0.3	0.4	<0.5
BH407	FD04	9/09/2020	Field_D	7.3	5.7	<0.4	13	20	15	<0.1	8.5	110	-	-	-	-	-	-	-
	RPD (%)			9	2	NC	***44***	11	7	NC	***38***	19	-	-	-	-	-	-	-

BOLD	RPD exceeds nominal threshold of 30% for inorganics and 50% for organics
NC	RPD not calculated as both the primary and duplicate sample were below the LOR. Where one of either the primary or duplicate samples were recorded below the laboratory LOR, the LOR was adopted to calculate the RPD

				TRH - NEPM 2013						TRH - NEPM 1999				PAHs															
				F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo[b+j]fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene-PAH	Phenanthrene	Pyrene
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				10	10	50	50	100	100	10	50	100	100	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 EIL-Commercial/Industrial (0-2m)																											170		
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil (0-2m)				215			170	1,700	3,300									1.4											
NEPM 2013 Table 1A(1) HIL D Comm/Ind																													
CRC CARE 2011 Soil Direct Contact HSL-D Commercial / Industrial				26,000		20,000		27,000	38,000																		11,000		
PFAS NEMP 2.0 2020 Ecological direct exposure																													
PFAS NEMP 2.0 2020 Ecological indirect exposure																													
PFAS NEMP 2018 Health Industrial/Commercial																													
Duplicates QA/QC																													
Location Code	**Field ID**	**Date**	**Type**																										
TP106	TP106_0.0-0.2	6/09/2018	Normal	<10	<10	<50	<50	<100	<100	<10	<50	<100	<100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP106	FD20	6/09/2018	Field_D	<10	<10	<50	<50	<100	<100	<10	<50	<100	<100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		RPD (%)		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
TP205	TP205_0.5-0.6	10/06/2020	Normal	<20	<20	<50	<50	<100	<100	<20	57	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP205	FD01	10/06/2020	Field_D	<20	<20	<50	<50	<100	<100	<20	<20	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		RPD (%)		NC	NC	NC	NC	NC	NC	NC	***96***	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
TP208	TP208_0.0-0.1	10/06/2020	Normal	<20	<20	<50	<50	<100	<100	<20	<20	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP208	FD05	10/06/2020	Field_D	<20	<20	<50	<50	<100	<100	<20	<20	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		RPD (%)		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
BH406	BH406_0.2-0.3	8/09/2020	Normal	<20	<20	<50	<50	<100	<100	<20	<20	61	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH406	FD03	8/09/2020	Field_D	<20	<20	<50	<50	<100	<100	<20	<20	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		RPD (%)		NC	NC	NC	NC	NC	NC	NC	NC	20	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
BH407	BH407_0.2-0.3	9/09/2020	Normal	<20	<20	<50	<50	160	<100	<20	21	120	70	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH407	FD04	9/09/2020	Field_D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		RPD (%)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

BOLD	RPD exceeds nominal threshold of 30% for inorganics and 50% for organics
NC	RPD not calculated as both the primary and duplicate sample were below the LOR. Where one of either the primary or duplicate samples were recorded below the laboratory LOR, the LOR was adopted to calculate the RPD

Appendix F – Laboratory certificates

CERTIFICATE OF ANALYSIS

Work Order	: **ES1824374**	Page	: 1 of 6
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS ALISON MONKLEY	Contact	: Brenda Hong
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: (02) 8784 8504
Project	: 2219573	Date Samples Received	: 17-Aug-2018 16:53
Order number	:	Date Analysis Commenced	: 20-Aug-2018
C-O-C number	: ----	Issue Date	: 23-Aug-2018 15:47
Sampler	: JULIAN FOWLER		
Site	:		
Quote number	: EN/005/18		
No. of samples received	: 12		
No. of samples analysed	: 4		

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
- Surrogate Control Limits

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

Signatories

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

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

General Comments

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

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

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

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

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

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

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

- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**BH102_0.0-0.2**	**BH102_0.5-0.6**	**BH103_0.0-0.2**	**BH103_0.5-0.6**	**----**
			Client sampling date / time	17-Aug-2018 00:00	17-Aug-2018 00:00	17-Aug-2018 00:00	17-Aug-2018 00:00	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1824374-001**	**ES1824374-003**	**ES1824374-007**	**ES1824374-009**	**--------**
				Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**14.2**	**9.8**	**1.3**	**25.2**	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	**No**	----	----
Asbestos (Trace)	1332-21-4	5	Fibres	----	----	**No**	----	----
Asbestos Type	1332-21-4	-	--	----	----	**-**	----	----
Sample weight (dry)	----	0.01	g	----	----	**355**	----	----
APPROVED IDENTIFIER:	----	-	--	----	----	**S.SPOONER**	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	----
Chromium	7440-47-3	2	mg/kg	**7**	**2**	<2	**2**	----
Copper	7440-50-8	5	mg/kg	**86**	**24**	<5	**11**	----
Lead	7439-92-1	5	mg/kg	**36**	**7**	<5	<5	----
Nickel	7440-02-0	2	mg/kg	<2	<2	<2	<2	----
Zinc	7440-66-6	5	mg/kg	**106**	**43**	**19**	**16**	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	**0.6**	**0.1**	<0.1	<0.1	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Client sample ID	**BH102_0.0-0.2**	**BH102_0.5-0.6**	**BH103_0.0-0.2**	**BH103_0.5-0.6**	**----**
			Client sampling date / time	17-Aug-2018 00:00	17-Aug-2018 00:00	17-Aug-2018 00:00	17-Aug-2018 00:00	----
Compound	CAS Number	LOR	Unit	**ES1824374-001**	**ES1824374-003**	**ES1824374-007**	**ES1824374-009**	**--------**
				Result	Result	Result	Result	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	**0.6**	**0.6**	**0.6**	**0.6**	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	**1.2**	**1.2**	**1.2**	**1.2**	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg	**240**	<100	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg	**260**	<100	<100	<100	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	**500**	<50	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	----
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	----
>C16 - C34 Fraction	----	100	mg/kg	**420**	**130**	<100	<100	----
>C34 - C40 Fraction	----	100	mg/kg	**180**	<100	<100	<100	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	**600**	**130**	<50	<50	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	<50	<50	<50	<50	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ **Sum of BTEX**	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
^ **Total Xylenes**	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**92.2**	**93.3**	**101**	**103**	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**83.1**	**83.5**	**81.5**	**81.2**	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**75.2**	**71.0**	**63.7**	**70.7**	----
EP075(SIM)T: PAH Surrogates								

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL)**			Client sample ID	**BH102_0.0-0.2**	**BH102_0.5-0.6**	**BH103_0.0-0.2**	**BH103_0.5-0.6**	**----**
			Client sampling date / time	17-Aug-2018 00:00	17-Aug-2018 00:00	17-Aug-2018 00:00	17-Aug-2018 00:00	----
Compound	CAS Number	LOR	Unit	**ES1824374-001**	**ES1824374-003**	**ES1824374-007**	**ES1824374-009**	**--------**
				Result	Result	Result	Result	----
EP075(SIM)T: PAH Surrogates - Continued								
2-Fluorobiphenyl	321-60-8	0.5	%	**85.1**	**85.3**	**87.4**	**85.8**	----
Anthracene-d10	1719-06-8	0.5	%	**84.3**	**85.6**	**86.8**	**85.0**	----
4-Terphenyl-d14	1718-51-0	0.5	%	**84.4**	**88.0**	**81.1**	**92.8**	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**92.6**	**88.0**	**95.4**	**88.0**	----
Toluene-D8	2037-26-5	0.2	%	**83.7**	**79.2**	**80.5**	**80.5**	----
4-Bromofluorobenzene	460-00-4	0.2	%	**88.5**	**82.9**	**84.8**	**84.7**	----

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	BH103_0.0-0.2 - 17-Aug-2018 00:00	Mid brown sandy soil.

Surrogate Control Limits

Sub-Matrix: **SOIL**

		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

Environmental

QUALITY CONTROL REPORT

Work Order : **ES1824374**

Client : **GHD PTY LTD**
Contact : MS ALISON MONKLEY
Address : PO BOX 5403
NEWCASTLE WEST NSW, AUSTRALIA 2302
Telephone : ----
Project : 2219573
Order number :
C-O-C number : ----
Sampler : JULIAN FOWLER
Site :
Quote number : EN/005/18
No. of samples received : 12
No. of samples analysed : 4

Page : 1 of 7

Laboratory : Environmental Division Sydney
Contact : Brenda Hong
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : (02) 8784 8504
Date Samples Received : 17-Aug-2018
Date Analysis Commenced : 20-Aug-2018
Issue Date : 23-Aug-2018

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 Quality Control Report contains the following information:

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

Signatories

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

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

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1887041)									
ES1824372-007	Anonymous	EA055: Moisture Content	----	0.1	%	48.2	51.4	6.34	0% - 20%
ES1824413-003	Anonymous	EA055: Moisture Content	----	0.1	%	7.6	7.3	4.79	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 1889224)									
ES1824297-002	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	18	22	20.4	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	10	10	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	10	12	18.4	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	35	32	6.98	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	38	39	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	1150	1200	4.19	0% - 20%
ES1824321-008	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	56	55	1.95	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	13	14	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	8	17.9	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	16	18	7.11	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	15	16	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	34	34	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1889225)									
ES1824297-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1824321-008	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1883707)									
ES1824321-003	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1883707) - continued									
ES1824321-003	Anonymous	EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1883260)									
ES1824258-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1824443-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1883706)									
ES1824321-003	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	120	<100	17.2	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1883260)									
ES1824258-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1824443-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1883706)									
ES1824321-003	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	130	<100	27.5	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080: BTEXN (QC Lot: 1883260)									
ES1824258-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Sub-Matrix**: SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080: BTEXN (QC Lot: 1883260) - continued									
ES1824443-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	*Laboratory Control Spike (LCS) Report*			
					Spike	*Spike Recovery (%)*	*Recovery Limits (%)*	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EG005T: Total Metals by ICP-AES (QCLot: 1889224)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	104	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	99.0	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	101	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	103	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	98.5	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	106	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	111	80	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1889225)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	79.3	70	105
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1883707)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	93.7	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	94.8	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	95.0	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	95.0	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	98.2	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	91.5	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	97.6	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	92.7	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	98.2	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	93.4	75	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	97.1	68	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	94.0	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	90.5	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	83.7	61	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	92.3	62	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	88.9	63	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1883260)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	83.7	68	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1883706)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	114	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	116	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	102	71	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1883260)								

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	*Laboratory Control Spike (LCS) Report*			
					Spike	*Spike Recovery (%)*	*Recovery Limits (%)*	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1883260) - continued								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	88.3	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1883706)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	115	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	111	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	120	63	131
EP080: BTEXN (QCLot: 1883260)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	90.8	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	85.2	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	84.1	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	84.1	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	88.2	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	92.3	63	119

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	*SpikeRecovery(%)*	*Recovery Limits (%)*	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG005T: Total Metals by ICP-AES (QCLot: 1889224)							
ES1824297-002	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	106	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	106	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	108	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	108	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	112	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	108	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	# Not Determined	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1889225)							
ES1824297-002	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	90.6	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1883707)							
ES1824321-003	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	91.8	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	91.8	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1883260)							
ES1824258-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	80.1	70	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	*SpikeRecovery(%)*	*Recovery Limits (%)*	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1883706)							
ES1824321-003	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	111	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	124	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	82.9	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1883260)							
ES1824258-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	80.8	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1883706)							
ES1824321-003	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	115	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	104	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	73.1	52	132
EP080: BTEXN (QCLot: 1883260)							
ES1824258-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	76.1	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	75.4	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	77.1	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	75.6	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	79.5	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	81.3	70	130

Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1824374**	Page	: 1 of 5
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS ALISON MONKLEY	Telephone	: (02) 8784 8504
Project	: 2219573	Date Samples Received	: 17-Aug-2018
Site	:	Issue Date	: 23-Aug-2018
Sampler	: JULIAN FOWLER	No. of samples received	: 12
Order number	:	No. of samples analysed	: 4

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EG005T: Total Metals by ICP-AES	ES1824297--002	Anonymous	**Zinc**	7440-66-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method	*Sample Date*	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) BH102_0.0-0.2, BH103_0.0-0.2, BH102_0.5-0.6, BH103_0.5-0.6	**17-Aug-2018**	**----**	----	----	**21-Aug-2018**	31-Aug-2018	✓
EA200: AS 4964 - 2004 Identification of Asbestos in Soils							
Snap Lock Bag: Separate bag received (EA200) BH103_0.0-0.2	**17-Aug-2018**	**----**	----	----	**20-Aug-2018**	13-Feb-2019	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) BH102_0.0-0.2, BH103_0.0-0.2, BH102_0.5-0.6, BH103_0.5-0.6	**17-Aug-2018**	**22-Aug-2018**	13-Feb-2019	✓	**22-Aug-2018**	13-Feb-2019	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) BH102_0.0-0.2, BH103_0.0-0.2, BH102_0.5-0.6, BH103_0.5-0.6	**17-Aug-2018**	**22-Aug-2018**	14-Sep-2018	✓	**22-Aug-2018**	14-Sep-2018	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) BH102_0.0-0.2, BH103_0.0-0.2, BH102_0.5-0.6, BH103_0.5-0.6	**17-Aug-2018**	**20-Aug-2018**	31-Aug-2018	✓	**21-Aug-2018**	29-Sep-2018	✓

Matrix: **SOIL**

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

Method **Container** / Client Sample ID(s)		**Sample Date**	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	**Date analysed**	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP071)								
BH102_0.0-0.2, BH103_0.0-0.2,	BH102_0.5-0.6, BH103_0.5-0.6	**17-Aug-2018**	**20-Aug-2018**	31-Aug-2018	✓	**21-Aug-2018**	29-Sep-2018	✓
Soil Glass Jar - Unpreserved (EP080)								
BH102_0.0-0.2, BH103_0.0-0.2,	BH102_0.5-0.6, BH103_0.5-0.6	**17-Aug-2018**	**20-Aug-2018**	31-Aug-2018	✓	**22-Aug-2018**	31-Aug-2018	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP071)								
BH102_0.0-0.2, BH103_0.0-0.2,	BH102_0.5-0.6, BH103_0.5-0.6	**17-Aug-2018**	**20-Aug-2018**	31-Aug-2018	✓	**21-Aug-2018**	29-Sep-2018	✓
Soil Glass Jar - Unpreserved (EP080)								
BH102_0.0-0.2, BH103_0.0-0.2,	BH102_0.5-0.6, BH103_0.5-0.6	**17-Aug-2018**	**20-Aug-2018**	31-Aug-2018	✓	**22-Aug-2018**	31-Aug-2018	✓
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080)								
BH102_0.0-0.2, BH103_0.0-0.2,	BH102_0.5-0.6, BH103_0.5-0.6	**17-Aug-2018**	**20-Aug-2018**	31-Aug-2018	✓	**22-Aug-2018**	31-Aug-2018	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

ALS Environmental

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095
Ph: 08 8359 0890 E: adelaide@alsglobal.com
☐BRISBANE 32 Shand Street Stafford QLD 4053
Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680
Ph: 07 7471 5600 E: gladstone@alsglobal.com

☐MACKAY 78 Harbour Road Mackay QLD 4740
Ph: 07 4944 0177 E: mackay@alsglobal.com
☐MELBOURNE 2-4 Westall Road Springvale VIC 3171
Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐MUDGEE 27 Sydney Road Mudgee NSW 2850
Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com

☑NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304
Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541
Ph: 024423 2063 E: nowra@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090
Ph: 08 9209 7655 E: samples.perth@alsglobal.com

☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164
Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818
Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: GHD
OFFICE: Newcastle
PROJECT: 2219573
ORDER NUMBER:
PROJECT MANAGER: Alison Monkley **CONTACT PH:** 49799999
SAMPLER: Julian Fowler **SAMPLER MOBILE:** 0466049181
COC emailed to ALS? (YES / NO) **EDD FORMAT (or default):** Esdat
Email Reports to (will default to PM if no other addresses are listed): Alison, ghdlab reports, ntl.car
Email Invoice to (will default to PM if no other addresses are listed): ap-fss@ghd.com

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☑ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)
COC: [✓ 1] 2 3 4 5 6 7
OF: [✓ 1] 2 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No [✓ N/A]
[✓ Free ice] / frozen ice bricks present upon receipt? [✓ Yes] No N/A
Random Sample Temperature on Receipt:
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Julian Fowler	4.55pm		MC
DATE/TIME: 17/08/18 1650	DATE/TIME: 17-8-18	DATE/TIME: 17/8/18 17:00	DATE/TIME: 17/8/18 7:30pm

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: As, Cd Cr, Cu, Hg, Ni, Pb, Zn

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	TPH, BTEXN, PAH, 8 metals	Asbestos presence/Absence	Asbestos Hold						Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	BH102_0.0-0.2		S		2	X		X						
2	BH102_0.2-0.3				2			X						
3	BH102_0.5-0.6				2	X		X						
4	BH102_1.0-1.1				2			X						
5	BH102_1.5-1.6				2			X						
6	FD2				1									
7	BH103_0.0-0.2				2	X	X							
8	BH103_0.2-0.3				2			X						
9	BH103_0.5-0.6				2	X		X						
10	BH103_1.0-1.1				2			X						
11	BH103_1.5-1.6				2			X						
12	FD3		↓		1									
					TOTAL									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

E-MAILED

Environmental Division
Sydney
Work Order Reference
ES1824374

Telephone : + 61-2-8784 8555

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order : **ES1825384**
Client : **GHD PTY LTD**
Contact : MS ALISON MONKLEY
Address : PO BOX 5403
NEWCASTLE WEST NSW, AUSTRALIA 2302
Telephone : ----
Project : 2219573
Order number : ----
C-O-C number : ----
Sampler : JULIAN FOWLER
Site :
Quote number : EN/005/18
No. of samples received : 3
No. of samples analysed : 1

Page : 1 of 5
Laboratory : Environmental Division Sydney
Contact : Brenda Hong
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : (02) 8784 8504
Date Samples Received : 28-Aug-2018 10:00
Date Analysis Commenced : 30-Aug-2018
Issue Date : 03-Sep-2018 13:27

ilac-MRA NATA
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*
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- EP068: Positive result has been confirmed by re-extraction and re-analysis.

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**COMP 1**	----	----	----	----
			Client sampling date / time	[17-Aug-2018]	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1825384-001**	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**5.2**	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	----	----	----
^ **Total Chlordane (sum)**	----	0.05	mg/kg	<0.05	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	**0.06**	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	----	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	----	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	----	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg	**0.06**	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	----	----	----	----
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	**96.0**	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**97.6**	----	----	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**COMP 1**	**----**	**----**	**----**	**----**
			Client sampling date / time	[17-Aug-2018]	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1825384-001**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**96.8**	**----**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	*CAS Number*	*Recovery Limits (%)*	
		Low	*High*
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143

QUALITY CONTROL REPORT

Work Order : **ES1825384**

Client : **GHD PTY LTD**
Contact : MS ALISON MONKLEY
Address : PO BOX 5403
NEWCASTLE WEST NSW, AUSTRALIA 2302
Telephone : ----
Project : 2219573
Order number : ----
C-O-C number : ----
Sampler : JULIAN FOWLER
Site :
Quote number : EN/005/18
No. of samples received : 3
No. of samples analysed : 1

Page : 1 of 5

Laboratory : Environmental Division Sydney
Contact : Brenda Hong
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : (02) 8784 8504
Date Samples Received : 28-Aug-2018
Date Analysis Commenced : 30-Aug-2018
Issue Date : 03-Sep-2018

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 Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix**: SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1906689)									
ES1825334-007	Anonymous	EA055: Moisture Content	----	0.1	%	47.0	46.3	1.54	0% - 20%
ES1825343-011	Anonymous	EA055: Moisture Content	----	0.1	%	11.7	11.3	3.32	0% - 20%
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 1904951)									
ES1825384-001	COMP 1	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1904950)									
ES1825384-001	COMP 1	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	0.06	0.07	25.5	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	**Client sample ID**	**Method: Compound**	**CAS Number**	**LOR**	**Unit**	**Original Result**	**Duplicate Result**	**RPD (%)**	**Recovery Limits (%)**
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1904950) - continued									
ES1825384-001	COMP 1	EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1904951)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	97.0	62	126
EP068A: Organochlorine Pesticides (OC) (QCLot: 1904950)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	99.6	69	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	98.5	65	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	101	67	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	100	68	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	101	65	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	97.5	67	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	102	69	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	103	62	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	103	63	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	101	66	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	103	64	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	102	66	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	102	67	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	94.8	67	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	104	69	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	108	69	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	102	56	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	98.6	62	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	90.3	66	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	101	64	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	84.7	54	130

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1904951)							
ES1825384-001	COMP 1	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	106	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 1904950)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 1904950) - continued							
ES1825384-001	COMP 1	EP068: gamma-BHC	58-89-9	0.5 mg/kg	94.9	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	89.4	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	91.4	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	107	70	130
		EP068: Endrin	72-20-8	2 mg/kg	89.3	70	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	81.1	70	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1825384**	Page	: 1 of 4
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS ALISON MONKLEY	Telephone	: (02) 8784 8504
Project	: 2219573	Date Samples Received	: 28-Aug-2018
Site	:	Issue Date	: 03-Sep-2018
Sampler	: JULIAN FOWLER	No. of samples received	: 3
Order number	: ----	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method *Container / Client Sample ID(s)*	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	**Date analysed**	*Due for analysis*	*Evaluation*
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) COMP 1	**17-Aug-2018**	**----**	----	----	**30-Aug-2018**	31-Aug-2018	✓
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066) COMP 1	**17-Aug-2018**	**30-Aug-2018**	31-Aug-2018	✓	**31-Aug-2018**	09-Oct-2018	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068) COMP 1	**17-Aug-2018**	**30-Aug-2018**	31-Aug-2018	✓	**31-Aug-2018**	09-Oct-2018	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Pesticides by GCMS	EP068	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Pesticides by GCMS	EP068	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Pesticides by GCMS	EP068	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504,505)

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Sample Compositing	* EN020	SOIL	Equal weights of each original soil are taken, then mixed and homogenised. The combined mixture is labelled as a new sample.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

Fadi Soro

FADI
28/8/18
10c—

From: Julian Fowler <Julian.Fowler@ghd.com>
Sent: Tuesday, 28 August 2018 9:37 AM
To: Samples Sydney
Subject: additional analysis for ES1824374

5650
#1,7

Good morning,

For work order ES1824374, I would like to request an analysis of a composite of 2 samples:
2 BH102_0.0-0.2
3 BH103_0.0-0.2
For OCP's and PCB 1. Comp 1

Let me know if there will be any issues.

Environmental Division
Sydney
Work Order Reference
ES1825384
Telephone : + 61-2-8784 8555

Thanks

Regards

Julian Fowler
Environmental Technician

GHD
T: 61 2 4979 9999 | D: 61 2 4979 9910 | V: 229910 | M1: 0466 049 181 | M2: 0423 163 493 | F 61 2 4979 9988 | E: julian.fowler@ghd.com
Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle, NSW, 2300 | PO Box 5403 HRMC, NSW, 2310, Australia | www.ghd.com

WATER | ENERGY & RESOURCES | ENVIRONMENT | PROPERTY & BUILDINGS | TRANSPORTATION

ALS Environmental

CERTIFICATE OF ADVANCE

Work Order : **ES1825728**
Client : **GHD PTY LTD**
Contact : MS ALISON MONKLEY
Address : PO BOX 5403
NEWCASTLE WEST NSW, AUSTRALIA 2302
Telephone : ----
Project : 2219573
Order number :
C-O-C number : ----
Sampler : JULIAN FOWLER
Site :
Quote number : EN/005/18
No. of samples received : 80
No. of samples analysed : 60

Page : 1 of 31
Laboratory : Environmental Division Sydney
Contact : Brenda Hong
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : (02) 8784 8504
Date Samples Received : 31-Aug-2018 13:08
Date Analysis Commenced : 05-Sep-2018
Issue Date : 10-Sep-2018 17:07

ilac-MRA NATA
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
- 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*
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Gerrad Morgan	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW

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.

- ASS: EA003 (NATA Field and F(ox) screening): pH F(ox) Reaction Rate: 1 - Slight; 2 - Moderate; 3 - Strong; 4 - Extreme
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- 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: **COMPOSITE** (Matrix: **SOIL**)			*Client sample ID*	**COMP 2**	**COMP 3**	**----**	**----**	**----**
			Client sampling date / time	30-Aug-2018 00:00	31-Aug-2018 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1825728-079**	**ES1825728-080**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**2.8**	**6.0**	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	----	----	----
^ **Total Chlordane (sum)**	----	0.05	mg/kg	<0.05	<0.05	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg	<0.05	<0.05	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	<0.05	----	----	----
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	**75.3**	**113**	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**106**	**134**	----	----	----

Analytical Results

Sub-Matrix: **COMPOSITE** (Matrix: **SOIL)**			Client sample ID	**COMP 2**	**COMP 3**	**----**	**----**	**----**
			Client sampling date / time	30-Aug-2018 00:00	31-Aug-2018 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1825728-079**	**ES1825728-080**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**97.7**	**107**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**BH108_0.0-0.2**	**BH101_0.0-0.2**	**BH101_0.45-0.5**	**BH301_0.0-0.2**	**BH301_0.45-0.5**
			Client sampling date / time	22-Aug-2018 00:00	29-Aug-2018 00:00	29-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES1825728-001**	**ES1825728-004**	**ES1825728-006**	**ES1825728-010**	**ES1825728-012**
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	----	<1.0	**4.6**	**6.3**	**9.2**
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	**No**	----	----	----
Asbestos (Trace)	1332-21-4	5	Fibres	**No**	**No**	----	----	----
Asbestos Type	1332-21-4	-	--	-	-	----	----	----
Sample weight (dry)	----	0.01	g	**373**	**406**	----	----	----
APPROVED IDENTIFIER:	----	-	--	**G.MORGAN**	**G.MORGAN**	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	<5	<5	<5	**9**
Cadmium	7440-43-9	1	mg/kg	----	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	----	<2	<2	**2**	**5**
Copper	7440-50-8	5	mg/kg	----	<5	<5	**7**	**13**
Lead	7439-92-1	5	mg/kg	----	<5	<5	**8**	**18**
Nickel	7440-02-0	2	mg/kg	----	<2	<2	**2**	**6**
Zinc	7440-66-6	5	mg/kg	----	**32**	**16**	**22**	**21**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	<0.1	<0.1	<0.1	<0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	----	<0.5	<0.5	**1.0**	**1.3**
Anthracene	120-12-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	----	<0.5	<0.5	**0.5**	**0.7**
Pyrene	129-00-0	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**BH108_0.0-0.2**	**BH101_0.0-0.2**	**BH101_0.45-0.5**	**BH301_0.0-0.2**	**BH301_0.45-0.5**
			Client sampling date / time	22-Aug-2018 00:00	29-Aug-2018 00:00	29-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES1825728-001**	**ES1825728-004**	**ES1825728-006**	**ES1825728-010**	**ES1825728-012**
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	----	<0.5	<0.5	**1.5**	**2.0**
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	----	**0.6**	**0.6**	**0.6**	**0.6**
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	----	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	----	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	----	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	----	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	----	<100	<100	<100	<100
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	----	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	<10	<10	<10	<10
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	----	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	----	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	----	<100	<100	<100	**100**
>C34 - C40 Fraction	----	100	mg/kg	----	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	----	<50	<50	<50	**100**
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	----	<50	<50	<50	<50
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
^ **Sum of BTEX**	----	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	----	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	----	<1	<1	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	----	**81.1**	**76.1**	**75.3**	**73.6**
2-Chlorophenol-D4	93951-73-6	0.5	%	----	**86.6**	**81.4**	**80.4**	**78.9**
2.4.6-Tribromophenol	118-79-6	0.5	%	----	**64.2**	**60.6**	**64.4**	**64.9**
EP075(SIM)T: PAH Surrogates								

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL)**			Client sample ID	**BH108_0.0-0.2**	**BH101_0.0-0.2**	**BH101_0.45-0.5**	**BH301_0.0-0.2**	**BH301_0.45-0.5**
			Client sampling date / time	22-Aug-2018 00:00	29-Aug-2018 00:00	29-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit	**ES1825728-001**	**ES1825728-004**	**ES1825728-006**	**ES1825728-010**	**ES1825728-012**
				Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued								
2-Fluorobiphenyl	321-60-8	0.5	%	----	**101**	**95.0**	**94.1**	**91.6**
Anthracene-d10	1719-06-8	0.5	%	----	**96.0**	**90.2**	**87.0**	**86.6**
4-Terphenyl-d14	1718-51-0	0.5	%	----	**81.2**	**76.8**	**76.9**	**74.7**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	----	**89.8**	**94.8**	**114**	**103**
Toluene-D8	2037-26-5	0.2	%	----	**89.9**	**93.2**	**115**	**99.3**
4-Bromofluorobenzene	460-00-4	0.2	%	----	**96.2**	**95.0**	**116**	**98.2**

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Client sample ID	**BH301_0.95-1.0**	**BH301_1.45-1.5**	**BH301_2.0-2.1**	**BH301_2.45-2.5**	**BH301_3.0-3.1**
			Client sampling date / time	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit	**ES1825728-013**	**ES1825728-014**	**ES1825728-015**	**ES1825728-016**	**ES1825728-017**
				Result	Result	Result	Result	Result
EA003 :pH (field/fox)								
pH (F)	----	0.1	pH Unit	**6.2**	**7.1**	**7.2**	**7.2**	**6.5**
pH (Fox)	----	0.1	pH Unit	**2.9**	**4.4**	**4.6**	**4.0**	**3.4**
Reaction Rate	----	1	Reaction Unit	**2**	**2**	**2**	**2**	**2**

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**BH301_3.5-3.6**	**BH302_0.0-0.2**	**BH302_0.2-0.3**	**BH302_0.95-1.0**	**BH302_1.45-1.5**
			Client sampling date / time	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES1825728-018**	**ES1825728-023**	**ES1825728-024**	**ES1825728-026**	**ES1825728-027**
				Result	Result	Result	Result	Result
EA003 :pH (field/fox)								
pH (F)	----	0.1	pH Unit	**6.5**	----	----	**7.7**	**6.8**
pH (Fox)	----	0.1	pH Unit	**3.6**	----	----	**3.4**	**4.0**
Reaction Rate	----	1	Reaction Unit	**2**	----	----	**3**	**2**
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	----	**9.5**	**5.6**	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	**6**	<5	----	----
Cadmium	7440-43-9	1	mg/kg	----	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg	----	**3**	**5**	----	----
Copper	7440-50-8	5	mg/kg	----	**14**	**10**	----	----
Lead	7439-92-1	5	mg/kg	----	**9**	**11**	----	----
Nickel	7440-02-0	2	mg/kg	----	**4**	**4**	----	----
Zinc	7440-66-6	5	mg/kg	----	**29**	**52**	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	<0.1	<0.1	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	<0.5	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	----	<0.5	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg	----	<0.5	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg	----	<0.5	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg	----	**0.6**	**0.6**	----	----
Anthracene	120-12-7	0.5	mg/kg	----	<0.5	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg	----	<0.5	<0.5	----	----
Pyrene	129-00-0	0.5	mg/kg	----	<0.5	<0.5	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	<0.5	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg	----	<0.5	<0.5	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	<0.5	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	<0.5	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	<0.5	<0.5	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	<0.5	<0.5	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	<0.5	<0.5	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	----	**0.6**	**0.6**	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	----	<0.5	<0.5	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**BH301_3.5-3.6**	**BH302_0.0-0.2**	**BH302_0.2-0.3**	**BH302_0.95-1.0**	**BH302_1.45-1.5**
			Client sampling date / time	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES1825728-018**	**ES1825728-023**	**ES1825728-024**	**ES1825728-026**	**ES1825728-027**
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	----	**0.6**	**0.6**	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	----	**1.2**	**1.2**	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	----	<10	<10	----	----
C10 - C14 Fraction	----	50	mg/kg	----	<50	<50	----	----
C15 - C28 Fraction	----	100	mg/kg	----	<100	<100	----	----
C29 - C36 Fraction	----	100	mg/kg	----	<100	<100	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	----	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	<10	<10	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	----	<10	<10	----	----
>C10 - C16 Fraction	----	50	mg/kg	----	<50	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg	----	<100	<100	----	----
>C34 - C40 Fraction	----	100	mg/kg	----	<100	<100	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	----	<50	<50	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	----	<50	<50	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	----	<0.2	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg	----	<0.5	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	----	<0.5	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	<0.5	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	----	<0.5	<0.5	----	----
^ **Sum of BTEX**	----	0.2	mg/kg	----	<0.2	<0.2	----	----
^ **Total Xylenes**	----	0.5	mg/kg	----	<0.5	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg	----	<1	<1	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	----	**74.0**	**74.8**	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	----	**79.2**	**79.8**	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	----	**70.3**	**65.7**	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	----	**91.6**	**92.5**	----	----
Anthracene-d10	1719-06-8	0.5	%	----	**86.7**	**86.6**	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Client sample ID	**BH301_3.5-3.6**	**BH302_0.0-0.2**	**BH302_0.2-0.3**	**BH302_0.95-1.0**	**BH302_1.45-1.5**
			Client sampling date / time	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit	**ES1825728-018**	**ES1825728-023**	**ES1825728-024**	**ES1825728-026**	**ES1825728-027**
				Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued								
4-Terphenyl-d14	1718-51-0	0.5	%	----	**74.8**	**74.6**	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	----	**98.4**	**99.1**	----	----
Toluene-D8	2037-26-5	0.2	%	----	**97.8**	**103**	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	----	**100**	**102**	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL)**			Client sample ID	**BH302_2.0-2.1**	**BH302_2.45-2.5**	**BH302_2.95-3.0**	**BH302_3.5-3.6**	**BH302_3.95-4.0**
			Client sampling date / time	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit	**ES1825728-028**	**ES1825728-029**	**ES1825728-030**	**ES1825728-031**	**ES1825728-032**
				Result	Result	Result	Result	Result
EA003 :pH (field/fox)								
pH (F)	----	0.1	pH Unit	**6.8**	**6.3**	**6.6**	**6.4**	**6.7**
pH (Fox)	----	0.1	pH Unit	**2.2**	**2.3**	**4.4**	**4.3**	**2.1**
Reaction Rate	----	1	Reaction Unit	**4**	**4**	**2**	**2**	**3**

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Client sample ID	**BH302_4.45-4.5**	**BH302_4.9-5.0**	**BH306_0.0-0.2**	**BH306_0.2-0.3**	**BH306_0.45-0.5**
			Client sampling date / time	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit	**ES1825728-033**	**ES1825728-034**	**ES1825728-036**	**ES1825728-037**	**ES1825728-038**
				Result	Result	Result	Result	Result
EA003 :pH (field/fox)								
pH (F)	----	0.1	pH Unit	**6.2**	**6.8**	----	----	**5.2**
pH (Fox)	----	0.1	pH Unit	**4.1**	**2.4**	----	----	**2.9**
Reaction Rate	----	1	Reaction Unit	**4**	**3**	----	----	**3**
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	----	----	**5.6**	**13.6**	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	----	**7**	<5	----
Cadmium	7440-43-9	1	mg/kg	----	----	<1	<1	----
Chromium	7440-47-3	2	mg/kg	----	----	**16**	**6**	----
Copper	7440-50-8	5	mg/kg	----	----	**16**	<5	----
Lead	7439-92-1	5	mg/kg	----	----	**20**	<5	----
Nickel	7440-02-0	2	mg/kg	----	----	**13**	<2	----
Zinc	7440-66-6	5	mg/kg	----	----	**69**	<5	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	----	<0.1	<0.1	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	----	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	<0.5	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg	----	----	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	----	----	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	----	----	**0.6**	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	----	----	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	----	----	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	----	----	<0.5	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	----	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	----	----	<0.5	<0.5	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	----	<0.5	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	----	<0.5	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	----	<0.5	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	----	<0.5	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	----	**0.6**	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	----	<0.5	<0.5	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**BH302_4.45-4.5**	**BH302_4.9-5.0**	**BH306_0.0-0.2**	**BH306_0.2-0.3**	**BH306_0.45-0.5**
			Client sampling date / time	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES1825728-033**	**ES1825728-034**	**ES1825728-036**	**ES1825728-037**	**ES1825728-038**
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	----	----	**0.6**	**0.6**	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	----	----	**1.2**	**1.2**	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	----	----	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg	----	----	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg	----	----	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg	----	----	<100	<100	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	----	----	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	----	<10	<10	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	----	----	<10	<10	----
>C10 - C16 Fraction	----	50	mg/kg	----	----	<50	<50	----
>C16 - C34 Fraction	----	100	mg/kg	----	----	<100	<100	----
>C34 - C40 Fraction	----	100	mg/kg	----	----	<100	<100	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	----	----	<50	<50	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	----	----	<50	<50	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	----	----	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg	----	----	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	----	----	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	----	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	----	----	<0.5	<0.5	----
^ **Sum of BTEX**	----	0.2	mg/kg	----	----	<0.2	<0.2	----
^ **Total Xylenes**	----	0.5	mg/kg	----	----	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg	----	----	<1	<1	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	----	----	**74.8**	**77.6**	----
2-Chlorophenol-D4	93951-73-6	0.5	%	----	----	**79.6**	**83.1**	----
2.4.6-Tribromophenol	118-79-6	0.5	%	----	----	**67.4**	**70.9**	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	----	----	**92.5**	**96.1**	----
Anthracene-d10	1719-06-8	0.5	%	----	----	**87.0**	**90.9**	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Client sample ID	**BH302_4.45-4.5**	**BH302_4.9-5.0**	**BH306_0.0-0.2**	**BH306_0.2-0.3**	**BH306_0.45-0.5**
			Client sampling date / time	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit	**ES1825728-033**	**ES1825728-034**	**ES1825728-036**	**ES1825728-037**	**ES1825728-038**
				Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued								
4-Terphenyl-d14	1718-51-0	0.5	%	----	----	**75.2**	**78.2**	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	----	----	**96.1**	**104**	----
Toluene-D8	2037-26-5	0.2	%	----	----	**88.2**	**106**	----
4-Bromofluorobenzene	460-00-4	0.2	%	----	----	**90.8**	**111**	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL)**			Client sample ID	**BH306_0.95-1.0**	**BH306_1.45-1.5**	**BH306_2.0-2.1**	**BH306_2.45-2.5**	**BH306_3.0-3.1**
			Client sampling date / time	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit	**ES1825728-039**	**ES1825728-040**	**ES1825728-041**	**ES1825728-042**	**ES1825728-043**
				Result	Result	Result	Result	Result
EA003 :pH (field/fox)								
pH (F)	----	0.1	pH Unit	**5.4**	**5.2**	**5.0**	**5.2**	**6.5**
pH (Fox)	----	0.1	pH Unit	**2.9**	**2.8**	**2.8**	**3.1**	**1.4**
Reaction Rate	----	1	Reaction Unit	**3**	**3**	**2**	**2**	**3**

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**BH306_3.5-3.6**	**BH306_3.9-4.0**	**BH306_4.45-4.5**	**BHA302_0.0-0.2**	**BHA302_0.2-0.3**
			Client sampling date / time	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES1825728-044**	**ES1825728-045**	**ES1825728-046**	**ES1825728-048**	**ES1825728-049**
				Result	Result	Result	Result	Result
EA003 :pH (field/fox)								
pH (F)	----	0.1	pH Unit	**6.4**	**6.5**	**6.2**	----	**7.7**
pH (Fox)	----	0.1	pH Unit	**1.8**	**2.4**	**2.2**	----	**4.7**
Reaction Rate	----	1	Reaction Unit	**3**	**3**	**4**	----	**3**
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	----	----	----	**7.3**	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	----	----	**6**	----
Cadmium	7440-43-9	1	mg/kg	----	----	----	<1	----
Chromium	7440-47-3	2	mg/kg	----	----	----	**4**	----
Copper	7440-50-8	5	mg/kg	----	----	----	**18**	----
Lead	7439-92-1	5	mg/kg	----	----	----	**23**	----
Nickel	7440-02-0	2	mg/kg	----	----	----	<2	----
Zinc	7440-66-6	5	mg/kg	----	----	----	**168**	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	----	----	<0.1	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	----	----	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	----	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg	----	----	----	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	----	----	----	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	----	----	----	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	----	----	----	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	----	----	----	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	----	----	----	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	----	----	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	----	----	----	<0.5	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	----	----	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	----	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	----	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	----	----	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	----	----	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	----	----	<0.5	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	----	----	----	<0.5	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	----	----	----	<0.5	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH306_3.5-3.6	BH306_3.9-4.0	BH306_4.45-4.5	BHA302_0.0-0.2	BHA302_0.2-0.3
			Client sampling date / time	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit	ES1825728-044	ES1825728-045	ES1825728-046	ES1825728-048	ES1825728-049
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	----	----	**0.6**	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	----	----	**1.2**	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	----	----	----	<10	----
C10 - C14 Fraction	----	50	mg/kg	----	----	----	<50	----
C15 - C28 Fraction	----	100	mg/kg	----	----	----	<100	----
C29 - C36 Fraction	----	100	mg/kg	----	----	----	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	----	----	----	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	----	----	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	----	----	<10	----
>C10 - C16 Fraction	----	50	mg/kg	----	----	----	<50	----
>C16 - C34 Fraction	----	100	mg/kg	----	----	----	<100	----
>C34 - C40 Fraction	----	100	mg/kg	----	----	----	<100	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	----	----	----	<50	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	----	----	<50	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	----	----	----	<0.2	----
Toluene	108-88-3	0.5	mg/kg	----	----	----	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	----	----	----	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	----	----	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	----	----	----	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg	----	----	----	<0.2	----
^ Total Xylenes	----	0.5	mg/kg	----	----	----	<0.5	----
Naphthalene	91-20-3	1	mg/kg	----	----	----	<1	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	----	----	----	**74.8**	----
2-Chlorophenol-D4	93951-73-6	0.5	%	----	----	----	**79.8**	----
2.4.6-Tribromophenol	118-79-6	0.5	%	----	----	----	**64.7**	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	----	----	----	**92.1**	----
Anthracene-d10	1719-06-8	0.5	%	----	----	----	**88.5**	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Client sample ID	**BH306_3.5-3.6**	**BH306_3.9-4.0**	**BH306_4.45-4.5**	**BHA302_0.0-0.2**	**BHA302_0.2-0.3**
			Client sampling date / time	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit	**ES1825728-044**	**ES1825728-045**	**ES1825728-046**	**ES1825728-048**	**ES1825728-049**
				Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued								
4-Terphenyl-d14	1718-51-0	0.5	%	----	----	----	**75.3**	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	----	----	----	**98.3**	----
Toluene-D8	2037-26-5	0.2	%	----	----	----	**98.9**	----
4-Bromofluorobenzene	460-00-4	0.2	%	----	----	----	**105**	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BHA302_0.45-0.5	BHA302_0.95-1.0	BHA302_1.45-1.5	BHA302_2.0-2.1	BHA302_2.45-2.5
			Client sampling date / time	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit	ES1825728-050	ES1825728-051	ES1825728-052	ES1825728-053	ES1825728-054
				Result	Result	Result	Result	Result
EA003 :pH (field/fox)								
pH (F)	----	0.1	pH Unit	**9.3**	**5.9**	**6.6**	**6.5**	**7.0**
pH (Fox)	----	0.1	pH Unit	**4.5**	**2.2**	**2.2**	**4.4**	**4.1**
Reaction Rate	----	1	Reaction Unit	**3**	**4**	**2**	**2**	**2**
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**24.7**	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**6**	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	**9**	----	----	----	----
Copper	7440-50-8	5	mg/kg	<5	----	----	----	----
Lead	7439-92-1	5	mg/kg	<5	----	----	----	----
Nickel	7440-02-0	2	mg/kg	**3**	----	----	----	----
Zinc	7440-66-6	5	mg/kg	<5	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL)**

			Client sample ID	**BHA302_0.45-0.5**	**BHA302_0.95-1.0**	**BHA302_1.45-1.5**	**BHA302_2.0-2.1**	**BHA302_2.45-2.5**
			Client sampling date / time	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES1825728-050**	**ES1825728-051**	**ES1825728-052**	**ES1825728-053**	**ES1825728-054**
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	**0.6**	----	----	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	**1.2**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	<50	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	<50	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	----	----
^ **Sum of BTEX**	----	0.2	mg/kg	<0.2	----	----	----	----
^ **Total Xylenes**	----	0.5	mg/kg	<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**75.1**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**80.6**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**65.6**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**93.2**	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%	**88.5**	----	----	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Client sample ID	**BHA302_0.45-0.5**	**BHA302_0.95-1.0**	**BHA302_1.45-1.5**	**BHA302_2.0-2.1**	**BHA302_2.45-2.5**
			Client sampling date / time	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit	**ES1825728-050**	**ES1825728-051**	**ES1825728-052**	**ES1825728-053**	**ES1825728-054**
				Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued								
4-Terphenyl-d14	1718-51-0	0.5	%	**76.2**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**86.6**	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	**80.7**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	**85.2**	----	----	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL)**			Client sample ID	**BHA302_3.0-3.1**	**BHA302_3.5-3.6**	**BHA302_3.9-4.0**	**BHA302_4.45-4.5**	**BHA302_4.9-5.0**
			Client sampling date / time	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit	**ES1825728-055**	**ES1825728-056**	**ES1825728-057**	**ES1825728-058**	**ES1825728-059**
				Result	Result	Result	Result	Result
EA003 :pH (field/fox)								
pH (F)	----	0.1	pH Unit	**7.1**	**7.0**	**6.6**	**7.1**	**6.1**
pH (Fox)	----	0.1	pH Unit	**2.3**	**2.1**	**4.2**	**2.9**	**3.8**
Reaction Rate	----	1	Reaction Unit	**4**	**3**	**2**	**2**	**4**

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

Client sample ID				**BHA304_0.0-0.2**	**BHA304_0.45-0.5**	**BHA304_0.95-1.0**	**BHA304_1.5-1.6**	**BHA304_2.0-2.1**
Client sampling date / time				30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES1825728-061**	**ES1825728-063**	**ES1825728-064**	**ES1825728-065**	**ES1825728-066**
				Result	Result	Result	Result	Result
EA003 :pH (field/fox)								
pH (F)	----	0.1	pH Unit	----	----	**7.2**	**5.6**	**5.7**
pH (Fox)	----	0.1	pH Unit	----	----	**3.9**	**2.5**	**1.9**
Reaction Rate	----	1	Reaction Unit	----	----	**3**	**4**	**4**
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**6.8**	**6.2**	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	----	----	----	----
Asbestos (Trace)	1332-21-4	5	Fibres	**No**	----	----	----	----
Asbestos Type	1332-21-4	-	--	**-**	----	----	----	----
Sample weight (dry)	----	0.01	g	**262**	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	**G.MORGAN**	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**7**	**15**	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	**8**	**6**	----	----	----
Copper	7440-50-8	5	mg/kg	**16**	**33**	----	----	----
Lead	7439-92-1	5	mg/kg	**100**	**148**	----	----	----
Nickel	7440-02-0	2	mg/kg	**6**	**5**	----	----	----
Zinc	7440-66-6	5	mg/kg	**144**	**282**	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	**0.6**	**0.8**	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	**1.7**	**1.2**	----	----	----
Pyrene	129-00-0	0.5	mg/kg	**1.6**	**1.3**	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	**0.5**	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg	**0.6**	**0.5**	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	**1.0**	**0.6**	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**BHA304_0.0-0.2**	**BHA304_0.45-0.5**	**BHA304_0.95-1.0**	**BHA304_1.5-1.6**	**BHA304_2.0-2.1**
			Client sampling date / time	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES1825728-061**	**ES1825728-063**	**ES1825728-064**	**ES1825728-065**	**ES1825728-066**
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Benzo(a)pyrene	50-32-8	0.5	mg/kg	**0.8**	**0.6**	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	**0.5**	<0.5	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	**0.8**	**0.5**	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	**8.1**	**5.5**	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	**1.0**	**0.7**	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**1.3**	**1.0**	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.6**	**1.3**	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	**160**	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	**160**	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	----	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	**170**	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	**150**	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	**320**	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	----	----	----
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Client sample ID	**BHA304_0.0-0.2**	**BHA304_0.45-0.5**	**BHA304_0.95-1.0**	**BHA304_1.5-1.6**	**BHA304_2.0-2.1**
			Client sampling date / time	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES1825728-061**	**ES1825728-063**	**ES1825728-064**	**ES1825728-065**	**ES1825728-066**
				Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates - Continued								
Phenol-d6	13127-88-3	0.5	%	**75.7**	**75.4**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**80.7**	**81.2**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**68.1**	**71.2**	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**93.8**	**93.4**	----	----	----
Anthracene-d10	1719-06-8	0.5	%	**88.5**	**88.5**	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	**74.5**	**75.1**	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**96.1**	**99.8**	----	----	----
Toluene-D8	2037-26-5	0.2	%	**94.9**	**98.9**	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	**99.4**	**102**	----	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Client sample ID	**BHA304_2.45-2.5**	**BHA304_3.0-3.1**	**BHA304_3.5-3.6**	**BHA304_3.95-4.0**	**BHA304_4.5-4.6**
			Client sampling date / time	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit	**ES1825728-067**	**ES1825728-068**	**ES1825728-069**	**ES1825728-070**	**ES1825728-071**
				Result	Result	Result	Result	Result
EA003 :pH (field/fox)								
pH (F)	----	0.1	pH Unit	**6.0**	**5.9**	**5.8**	**5.9**	**5.9**
pH (Fox)	----	0.1	pH Unit	**2.2**	**2.1**	**2.2**	**2.2**	**2.2**
Reaction Rate	----	1	Reaction Unit	**4**	**4**	**4**	**4**	**4**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BHA304_4.9-5.0	BH104_0.0-0.2	BH104_0.2-0.3	----	----
			Client sampling date / time	30-Aug-2018 00:00	31-Jul-2018 00:00	31-Jul-2018 00:00	----	----
Compound	CAS Number	LOR	Unit	ES1825728-072	ES1825728-074	ES1825728-075	--------	--------
				Result	Result	Result	----	----
EA003 :pH (field/fox)								
pH (F)	----	0.1	pH Unit	**6.1**	----	----	----	----
pH (Fox)	----	0.1	pH Unit	**2.1**	----	----	----	----
Reaction Rate	----	1	Reaction Unit	**3**	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	----	**3.9**	**6.2**	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	**No**	----	----	----
Asbestos (Trace)	1332-21-4	5	Fibres	----	**No**	----	----	----
Asbestos Type	1332-21-4	-	--	----	**-**	----	----	----
Sample weight (dry)	----	0.01	g	----	**155**	----	----	----
APPROVED IDENTIFIER:	----	-	--	----	**G.MORGAN**	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	<5	<5	----	----
Cadmium	7440-43-9	1	mg/kg	----	<1	**1**	----	----
Chromium	7440-47-3	2	mg/kg	----	**5**	**7**	----	----
Copper	7440-50-8	5	mg/kg	----	**72**	**120**	----	----
Lead	7439-92-1	5	mg/kg	----	**25**	**36**	----	----
Nickel	7440-02-0	2	mg/kg	----	<2	**2**	----	----
Zinc	7440-66-6	5	mg/kg	----	**108**	**166**	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	**0.4**	**0.6**	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	<0.5	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	----	<0.5	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg	----	<0.5	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg	----	<0.5	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg	----	<0.5	<0.5	----	----
Anthracene	120-12-7	0.5	mg/kg	----	<0.5	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg	----	<0.5	<0.5	----	----
Pyrene	129-00-0	0.5	mg/kg	----	<0.5	<0.5	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	<0.5	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg	----	<0.5	<0.5	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	<0.5	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	<0.5	<0.5	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**BHA304_4.9-5.0**	**BH104_0.0-0.2**	**BH104_0.2-0.3**	**----**	**----**
			Client sampling date / time	30-Aug-2018 00:00	31-Jul-2018 00:00	31-Jul-2018 00:00	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1825728-072**	**ES1825728-074**	**ES1825728-075**	**--------**	**--------**
				Result	Result	Result	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	<0.5	<0.5	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	<0.5	<0.5	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	<0.5	<0.5	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	----	<0.5	<0.5	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	----	<0.5	<0.5	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	----	**0.6**	**0.6**	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	----	**1.2**	**1.2**	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	----	<10	<10	----	----
C10 - C14 Fraction	----	50	mg/kg	----	<50	<50	----	----
C15 - C28 Fraction	----	100	mg/kg	----	**180**	**340**	----	----
C29 - C36 Fraction	----	100	mg/kg	----	**240**	**370**	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	----	**420**	**710**	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	<10	<10	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	----	<10	<10	----	----
>C10 - C16 Fraction	----	50	mg/kg	----	<50	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg	----	**350**	**600**	----	----
>C34 - C40 Fraction	----	100	mg/kg	----	**140**	**200**	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	----	**490**	**800**	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	----	<50	<50	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	----	<0.2	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg	----	<0.5	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	----	<0.5	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	<0.5	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	----	<0.5	<0.5	----	----
^ **Sum of BTEX**	----	0.2	mg/kg	----	<0.2	<0.2	----	----
^ **Total Xylenes**	----	0.5	mg/kg	----	<0.5	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg	----	<1	<1	----	----
EP075(SIM)S: Phenolic Compound Surrogates								

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Client sample ID	**BHA304_4.9-5.0**	**BH104_0.0-0.2**	**BH104_0.2-0.3**	**----**	**----**
			Client sampling date / time	30-Aug-2018 00:00	31-Jul-2018 00:00	31-Jul-2018 00:00	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1825728-072**	**ES1825728-074**	**ES1825728-075**	**--------**	**--------**
				Result	Result	Result	----	----
EP075(SIM)S: Phenolic Compound Surrogates - Continued								
Phenol-d6	13127-88-3	0.5	%	----	**80.4**	**80.6**	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	----	**85.2**	**83.1**	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	----	**68.8**	**71.9**	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	----	**85.5**	**85.4**	----	----
Anthracene-d10	1719-06-8	0.5	%	----	**86.1**	**87.1**	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	----	**84.0**	**92.2**	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	----	**96.4**	**109**	----	----
Toluene-D8	2037-26-5	0.2	%	----	**97.8**	**106**	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	----	**99.0**	**109**	----	----

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	BH108_0.0-0.2 - 22-Aug-2018 00:00	Mid brown sandy soil.
EA200: Description	BH101_0.0-0.2 - 29-Aug-2018 00:00	Mid brown sandy soil.
EA200: Description	BHA304_0.0-0.2 - 30-Aug-2018 00:00	Mid brown sandy soil.
EA200: Description	BH104_0.0-0.2 - 31-Jul-2018 00:00	Mid brown sandy soil.

Surrogate Control Limits

Sub-Matrix: **COMPOSITE**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

QUALITY CONTROL REPORT

Work Order	: **ES1825728**	Page	: 1 of 11
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS ALISON MONKLEY	Contact	: Brenda Hong
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: (02) 8784 8504
Project	: 2219573	Date Samples Received	: 31-Aug-2018
Order number	:	Date Analysis Commenced	: 05-Sep-2018
C-O-C number	: ----	Issue Date	: 10-Sep-2018
Sampler	: JULIAN FOWLER		
Site	:		
Quote number	: EN/005/18		
No. of samples received	: 80		
No. of samples analysed	: 60		

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 Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Gerrad Morgan	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA003 :pH (field/fox) (QC Lot: 1919242)									
ES1825728-013	BH301_0.95-1.0	EA003: pH (F)	----	0.1	pH Unit	6.2	6.2	0.00	0% - 20%
		EA003: pH (Fox)	----	0.1	pH Unit	2.9	2.9	0.00	0% - 20%
ES1825728-029	BH302_2.45-2.5	EA003: pH (F)	----	0.1	pH Unit	6.3	6.4	1.57	0% - 20%
		EA003: pH (Fox)	----	0.1	pH Unit	2.3	2.2	4.44	0% - 20%
EA003 :pH (field/fox) (QC Lot: 1919243)									
ES1825728-043	BH306_3.0-3.1	EA003: pH (F)	----	0.1	pH Unit	6.5	6.5	0.00	0% - 20%
		EA003: pH (Fox)	----	0.1	pH Unit	1.4	1.4	0.00	0% - 50%
ES1825728-054	BHA302_2.45-2.5	EA003: pH (F)	----	0.1	pH Unit	7.0	6.9	1.44	0% - 20%
		EA003: pH (Fox)	----	0.1	pH Unit	4.1	4.2	2.41	0% - 20%
EA003 :pH (field/fox) (QC Lot: 1919244)									
ES1825728-069	BHA304_3.5-3.6	EA003: pH (F)	----	0.1	pH Unit	5.8	5.8	0.00	0% - 20%
		EA003: pH (Fox)	----	0.1	pH Unit	2.2	2.2	0.00	0% - 20%
ES1826106-009	Anonymous	EA003: pH (F)	----	0.1	pH Unit	7.4	7.3	1.36	0% - 20%
		EA003: pH (Fox)	----	0.1	pH Unit	3.4	3.4	0.00	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1916932)									
ES1825728-010	BH301_0.0-0.2	EA055: Moisture Content	----	0.1	%	6.3	6.9	9.59	No Limit
ES1825728-075	BH104_0.2-0.3	EA055: Moisture Content	----	0.1	%	6.2	4.7	28.4	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 1919079)									
ES1825728-004	BH101_0.0-0.2	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG005T: Total Metals by ICP-AES (QC Lot: 1919079) - continued									
ES1825728-004	BH101_0.0-0.2	EG005T: Zinc	7440-66-6	5	mg/kg	32	28	12.7	No Limit
ES1825728-061	BHA304_0.0-0.2	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	8	9	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	6	6	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	7	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	16	16	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	100	120	18.5	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	144	158	9.12	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 1919239)									
ES1825728-074	BH104_0.0-0.2	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	5	6	18.8	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	72	82	13.2	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	25	30	19.7	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	108	101	6.72	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1919080)									
ES1825728-004	BH101_0.0-0.2	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1825728-061	BHA304_0.0-0.2	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1919240)									
ES1825728-074	BH104_0.0-0.2	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.4	0.5	0.00	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 1917223)									
ES1825728-079	COMP 2	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1917222)									
ES1825728-079	COMP 2	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1917222) - continued									
ES1825728-079	COMP 2	EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1914407)									
ES1825728-004	BH101_0.0-0.2	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1825728-061	BHA304_0.0-0.2	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	0.6	0.8	26.3	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	1.7	2.3	31.9	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	1.6	2.2	31.8	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	0.5	0.8	37.4	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	0.6	1.0	41.1	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	1.0	1.4	38.3	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	0.6	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1914407) - continued									
ES1825728-061	BHA304_0.0-0.2	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	0.8	1.2	37.5	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	0.5	0.8	43.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	0.8	1.1	41.2	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	8.1	# 12.2	40.4	0% - 20%
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	1.0	1.6	43.7	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1915278)									
ES1826014-007	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1914408)									
ES1825728-004	BH101_0.0-0.2	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1825728-061	BHA304_0.0-0.2	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1914563)									
ES1825728-004	BH101_0.0-0.2	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1825728-061	BHA304_0.0-0.2	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1915277)									
ES1826014-007	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1915277) - continued									
ES1826014-007	Anonymous	EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1914408)									
ES1825728-004	BH101_0.0-0.2	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1825728-061	BHA304_0.0-0.2	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1914563)									
ES1825728-004	BH101_0.0-0.2	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1825728-061	BHA304_0.0-0.2	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1915277)									
ES1826014-007	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	120	100	16.9	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080: BTEXN (QC Lot: 1914563)									
ES1825728-004	BH101_0.0-0.2	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1825728-061	BHA304_0.0-0.2	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	*Laboratory Control Spike (LCS) Report*			
					Spike	*Spike Recovery (%)*	*Recovery Limits (%)*	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EG005T: Total Metals by ICP-AES (QCLot: 1919079)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	112	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	89.7	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	106	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	110	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	95.0	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	99.9	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	109	80	122
EG005T: Total Metals by ICP-AES (QCLot: 1919239)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	95.0	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	102	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	92.7	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	95.0	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	101	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	104	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	110	80	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1919080)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	73.2	70	105
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1919240)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	72.0	70	105
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1917223)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	102	62	126
EP068A: Organochlorine Pesticides (OC) (QCLot: 1917222)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	95.5	69	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	93.1	65	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	95.8	67	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	95.9	68	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	100	65	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	94.0	67	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	93.8	69	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	98.2	62	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	97.8	63	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	100	66	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	101	64	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	98.4	66	116

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	*Laboratory Control Spike (LCS) Report*			
					Spike	*Spike Recovery (%)*	*Recovery Limits (%)*	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EP068A: Organochlorine Pesticides (OC) (QCLot: 1917222) - continued								
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	106	67	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	93.7	67	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	99.1	69	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	100	69	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	94.9	56	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	92.7	62	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	90.1	66	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	97.1	64	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	82.3	54	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1914407)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	123	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	123	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	118	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	122	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	120	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	120	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	123	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	125	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	109	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	120	75	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	108	68	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	124	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	116	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	117	61	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	118	62	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	113	63	121
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1915278)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	96.2	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	94.6	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	92.7	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	98.4	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	95.6	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	97.8	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	98.5	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	99.4	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	95.1	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	92.1	75	127

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1915278) - continued								
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	94.4	68	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	93.7	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	89.9	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	97.0	61	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	96.0	62	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	97.1	63	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1914408)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	91.3	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	92.6	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	92.5	71	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1914563)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	89.8	68	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1915277)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	102	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	106	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	93.6	71	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1914408)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	94.6	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	90.8	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	96.4	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1914563)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	94.1	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1915277)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	107	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	108	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	81.0	63	131
EP080: BTEXN (QCLot: 1914563)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	93.4	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	83.1	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	85.0	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	84.1	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	89.9	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	81.4	63	119

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	*SpikeRecovery(%)*	*Recovery Limits (%)*	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG005T: Total Metals by ICP-AES (QCLot: 1919079)							
ES1825728-004	BH101_0.0-0.2	EG005T: Arsenic	7440-38-2	50 mg/kg	122	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	94.4	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	102	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	108	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	98.0	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	95.5	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	110	70	130
EG005T: Total Metals by ICP-AES (QCLot: 1919239)							
ES1825728-074	BH104_0.0-0.2	EG005T: Arsenic	7440-38-2	50 mg/kg	96.5	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	100	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	103	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	92.1	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	99.5	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	100	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	101	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1919080)							
ES1825728-004	BH101_0.0-0.2	EG035T: Mercury	7439-97-6	5 mg/kg	73.7	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1919240)							
ES1825728-074	BH104_0.0-0.2	EG035T: Mercury	7439-97-6	5 mg/kg	75.7	70	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1917223)							
ES1825728-079	COMP 2	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	95.0	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 1917222)							
ES1825728-079	COMP 2	EP068: gamma-BHC	58-89-9	0.5 mg/kg	95.6	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	86.3	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	87.7	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	99.2	70	130
		EP068: Endrin	72-20-8	2 mg/kg	90.2	70	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	93.3	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1914407)							
ES1825728-004	BH101_0.0-0.2	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	95.2	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	112	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1915278)							
ES1826014-007	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	93.0	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	90.1	70	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1914408)							
ES1825728-004	BH101_0.0-0.2	EP071: C10 - C14 Fraction	----	523 mg/kg	106	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	118	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	127	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1914563)							
ES1825728-004	BH101_0.0-0.2	EP080: C6 - C9 Fraction	----	32.5 mg/kg	87.7	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1915277)							
ES1826014-007	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	82.2	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	114	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	125	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1914408)							
ES1825728-004	BH101_0.0-0.2	EP071: >C10 - C16 Fraction	----	860 mg/kg	109	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	122	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	118	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1914563)							
ES1825728-004	BH101_0.0-0.2	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	90.9	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1915277)							
ES1826014-007	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	95.3	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	120	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	107	52	132
EP080: BTEXN (QCLot: 1914563)							
ES1825728-004	BH101_0.0-0.2	EP080: Benzene	71-43-2	2.5 mg/kg	82.9	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	82.2	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	81.7	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	81.2	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	84.1	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	71.2	70	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1825728**	Page	: 1 of 10
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS ALISON MONKLEY	Telephone	: (02) 8784 8504
Project	: 2219573	Date Samples Received	: 31-Aug-2018
Site	:	Issue Date	: 10-Sep-2018
Sampler	: JULIAN FOWLER	No. of samples received	: 80
Order number	:	No. of samples analysed	: 60

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	**Analyte**	CAS Number	Data	Limits	**Comment**
Duplicate (DUP) RPDs							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	ES1825728--061	BHA304_0.0-0.2	**Sum of polycyclic aromatic hydrocarbons**	----	40.4 %	0% - 20%	**RPD exceeds LOR based limits**

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)	*Date extracted*	*Due for extraction*	***Days overdue***	*Date analysed*	*Due for analysis*	***Days overdue***
EA055: Moisture Content (Dried @ 105-110°C)						
Soil Glass Jar - Unpreserved BH104_0.0-0.2, BH104_0.2-0.3	----	----	----	06-Sep-2018	14-Aug-2018	**23**
EG035T: Total Recoverable Mercury by FIMS						
Soil Glass Jar - Unpreserved BH104_0.0-0.2, BH104_0.2-0.3	06-Sep-2018	28-Aug-2018	**9**	07-Sep-2018	28-Aug-2018	**10**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
Soil Glass Jar - Unpreserved BH104_0.0-0.2, BH104_0.2-0.3	05-Sep-2018	14-Aug-2018	**22**	----	----	----
EP080/071: Total Petroleum Hydrocarbons						
Soil Glass Jar - Unpreserved BH104_0.0-0.2, BH104_0.2-0.3	05-Sep-2018	14-Aug-2018	**22**	----	----	----
Soil Glass Jar - Unpreserved BH104_0.0-0.2, BH104_0.2-0.3	05-Sep-2018	14-Aug-2018	**22**	06-Sep-2018	14-Aug-2018	**23**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions						
Soil Glass Jar - Unpreserved BH104_0.0-0.2, BH104_0.2-0.3	05-Sep-2018	14-Aug-2018	**22**	----	----	----
Soil Glass Jar - Unpreserved BH104_0.0-0.2, BH104_0.2-0.3	05-Sep-2018	14-Aug-2018	**22**	06-Sep-2018	14-Aug-2018	**23**
EP080: BTEXN						
Soil Glass Jar - Unpreserved BH104_0.0-0.2, BH104_0.2-0.3	05-Sep-2018	14-Aug-2018	**22**	06-Sep-2018	14-Aug-2018	**23**

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method ***Container*** */ Client Sample ID(s)*	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EA003 :pH (field/fox)							
Snap Lock Bag - frozen on receipt at ALS (EA003) BH301_0.95-1.0, BH301_1.45-1.5, BH301_2.0-2.1, BH301_2.45-2.5, BH301_3.0-3.1, BH301_3.5-3.6, BH302_0.95-1.0, BH302_1.45-1.5, BH302_2.0-2.1, BH302_2.45-2.5, BH302_2.95-3.0, BH302_3.5-3.6, BH302_3.95-4.0, BH302_4.45-4.5, BH302_4.9-5.0, BH306_0.45-0.5, BH306_0.95-1.0, BH306_1.45-1.5, BH306_2.0-2.1, BH306_2.45-2.5, BH306_3.0-3.1, BH306_3.5-3.6, BH306_3.9-4.0, BH306_4.45-4.5, BHA302_0.45-0.5, BHA302_0.95-1.0, BHA302_1.45-1.5, BHA302_2.0-2.1, BHA302_2.45-2.5, BHA302_3.0-3.1, BHA302_3.5-3.6, BHA302_3.9-4.0, BHA302_4.45-4.5, BHA302_4.9-5.0, BHA304_0.95-1.0, BHA304_1.5-1.6, BHA304_2.0-2.1, BHA304_2.45-2.5, BHA304_3.0-3.1, BHA304_3.5-3.6, BHA304_3.95-4.0, BHA304_4.5-4.6, BHA304_4.9-5.0	**30-Aug-2018**	**07-Sep-2018**	25-May-2021	✓	**07-Sep-2018**	06-Dec-2018	✓
Soil Glass Jar - Frozen on receipt (EA003) BHA302_0.2-0.3	**30-Aug-2018**	**07-Sep-2018**	25-May-2021	✓	**07-Sep-2018**	06-Dec-2018	✓

Matrix: **SOIL**

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

Method	*Sample Date*	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) BH101_0.0-0.2, BH101_0.45-0.5	**29-Aug-2018**	**----**	----	----	**06-Sep-2018**	12-Sep-2018	✓
Soil Glass Jar - Unpreserved (EA055) BH301_0.0-0.2, BH301_0.45-0.5, BH302_0.0-0.2, BH302_0.2-0.3, BH306_0.0-0.2, BH306_0.2-0.3, BHA302_0.0-0.2, BHA302_0.45-0.5, BHA304_0.0-0.2, BHA304_0.45-0.5, COMP 2	**30-Aug-2018**	**----**	----	----	**06-Sep-2018**	13-Sep-2018	✓
Soil Glass Jar - Unpreserved (EA055) COMP 3	**31-Aug-2018**	**----**	----	----	**06-Sep-2018**	14-Sep-2018	✓
Soil Glass Jar - Unpreserved (EA055) BH104_0.0-0.2, BH104_0.2-0.3	**31-Jul-2018**	**----**	----	----	**06-Sep-2018**	14-Aug-2018	✗
EA200: AS 4964 - 2004 Identification of Asbestos in Soils							
Snap Lock Bag - ACM/Asbestos Grab Bag (EA200) BH108_0.0-0.2	**22-Aug-2018**	**----**	----	----	**05-Sep-2018**	18-Feb-2019	✓
Snap Lock Bag - ACM/Asbestos Grab Bag (EA200) BH101_0.0-0.2	**29-Aug-2018**	**----**	----	----	**05-Sep-2018**	25-Feb-2019	✓
Snap Lock Bag - ACM/Asbestos Grab Bag (EA200) BHA304_0.0-0.2	**30-Aug-2018**	**----**	----	----	**05-Sep-2018**	26-Feb-2019	✓
Snap Lock Bag - ACM/Asbestos Grab Bag (EA200) BH104_0.0-0.2	**31-Jul-2018**	**----**	----	----	**05-Sep-2018**	27-Jan-2019	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) BH101_0.0-0.2, BH101_0.45-0.5	**29-Aug-2018**	**06-Sep-2018**	25-Feb-2019	✓	**06-Sep-2018**	25-Feb-2019	✓
Soil Glass Jar - Unpreserved (EG005T) BH301_0.0-0.2, BH301_0.45-0.5, BH302_0.0-0.2, BH302_0.2-0.3, BH306_0.0-0.2, BH306_0.2-0.3, BHA302_0.0-0.2, BHA302_0.45-0.5, BHA304_0.0-0.2, BHA304_0.45-0.5	**30-Aug-2018**	**06-Sep-2018**	26-Feb-2019	✓	**06-Sep-2018**	26-Feb-2019	✓
Soil Glass Jar - Unpreserved (EG005T) BH104_0.0-0.2, BH104_0.2-0.3	**31-Jul-2018**	**06-Sep-2018**	27-Jan-2019	✓	**06-Sep-2018**	27-Jan-2019	✓

Matrix: **SOIL**

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

Method	***Sample Date***	*Extraction / Preparation*			*Analysis*		
***Container** / Client Sample ID(s)*		***Date extracted***	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) BH101_0.0-0.2, BH101_0.45-0.5	**29-Aug-2018**	**06-Sep-2018**	26-Sep-2018	✓	**07-Sep-2018**	26-Sep-2018	✓
Soil Glass Jar - Unpreserved (EG035T) BH301_0.0-0.2, BH301_0.45-0.5, BH302_0.0-0.2, BH302_0.2-0.3, BH306_0.0-0.2, BH306_0.2-0.3, BHA302_0.0-0.2, BHA302_0.45-0.5, BHA304_0.0-0.2, BHA304_0.45-0.5	**30-Aug-2018**	**06-Sep-2018**	27-Sep-2018	✓	**07-Sep-2018**	27-Sep-2018	✓
Soil Glass Jar - Unpreserved (EG035T) BH104_0.0-0.2, BH104_0.2-0.3	**31-Jul-2018**	**06-Sep-2018**	28-Aug-2018	✗	**07-Sep-2018**	28-Aug-2018	✗
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066) COMP 2	**30-Aug-2018**	**06-Sep-2018**	13-Sep-2018	✓	**07-Sep-2018**	16-Oct-2018	✓
Soil Glass Jar - Unpreserved (EP066) COMP 3	**31-Aug-2018**	**06-Sep-2018**	14-Sep-2018	✓	**07-Sep-2018**	16-Oct-2018	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068) COMP 2	**30-Aug-2018**	**06-Sep-2018**	13-Sep-2018	✓	**07-Sep-2018**	16-Oct-2018	✓
Soil Glass Jar - Unpreserved (EP068) COMP 3	**31-Aug-2018**	**06-Sep-2018**	14-Sep-2018	✓	**07-Sep-2018**	16-Oct-2018	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) BH101_0.0-0.2, BH101_0.45-0.5	**29-Aug-2018**	**05-Sep-2018**	12-Sep-2018	✓	**06-Sep-2018**	15-Oct-2018	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) BH301_0.0-0.2, BH301_0.45-0.5, BH302_0.0-0.2, BH302_0.2-0.3, BH306_0.0-0.2, BH306_0.2-0.3, BHA302_0.0-0.2, BHA302_0.45-0.5, BHA304_0.0-0.2, BHA304_0.45-0.5	**30-Aug-2018**	**05-Sep-2018**	13-Sep-2018	✓	**06-Sep-2018**	15-Oct-2018	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) BH104_0.0-0.2, BH104_0.2-0.3	**31-Jul-2018**	**05-Sep-2018**	14-Aug-2018	✗	**05-Sep-2018**	15-Oct-2018	✓

Matrix: **SOIL**

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

Method **Container** / Client Sample ID(s)	**Sample Date**	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	**Date analysed**	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) BH101_0.0-0.2, BH101_0.45-0.5	**29-Aug-2018**	**05-Sep-2018**	12-Sep-2018	✓	**06-Sep-2018**	12-Sep-2018	✓
Soil Glass Jar - Unpreserved (EP080) BH301_0.0-0.2, BH301_0.45-0.5, BH302_0.0-0.2, BH302_0.2-0.3, BH306_0.0-0.2, BH306_0.2-0.3, BHA302_0.0-0.2, BHA302_0.45-0.5, BHA304_0.0-0.2, BHA304_0.45-0.5	**30-Aug-2018**	**05-Sep-2018**	13-Sep-2018	✓	**06-Sep-2018**	13-Sep-2018	✓
Soil Glass Jar - Unpreserved (EP071) BH104_0.0-0.2	**31-Jul-2018**	**05-Sep-2018**	14-Aug-2018	✗	**05-Sep-2018**	15-Oct-2018	✓
Soil Glass Jar - Unpreserved (EP080) BH104_0.0-0.2	**31-Jul-2018**	**05-Sep-2018**	14-Aug-2018	✗	**06-Sep-2018**	14-Aug-2018	✗
Soil Glass Jar - Unpreserved (EP071) BH104_0.2-0.3	**31-Jul-2018**	**05-Sep-2018**	14-Aug-2018	✗	**05-Sep-2018**	15-Oct-2018	✓
Soil Glass Jar - Unpreserved (EP080) BH104_0.2-0.3	**31-Jul-2018**	**05-Sep-2018**	14-Aug-2018	✗	**06-Sep-2018**	14-Aug-2018	✗
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080) BH101_0.0-0.2, BH101_0.45-0.5	**29-Aug-2018**	**05-Sep-2018**	12-Sep-2018	✓	**06-Sep-2018**	12-Sep-2018	✓
Soil Glass Jar - Unpreserved (EP080) BH301_0.0-0.2, BH301_0.45-0.5, BH302_0.0-0.2, BH302_0.2-0.3, BH306_0.0-0.2, BH306_0.2-0.3, BHA302_0.0-0.2, BHA302_0.45-0.5, BHA304_0.0-0.2, BHA304_0.45-0.5	**30-Aug-2018**	**05-Sep-2018**	13-Sep-2018	✓	**06-Sep-2018**	13-Sep-2018	✓
Soil Glass Jar - Unpreserved (EP071) BH104_0.0-0.2	**31-Jul-2018**	**05-Sep-2018**	14-Aug-2018	✗	**05-Sep-2018**	15-Oct-2018	✓
Soil Glass Jar - Unpreserved (EP080) BH104_0.0-0.2	**31-Jul-2018**	**05-Sep-2018**	14-Aug-2018	✗	**06-Sep-2018**	14-Aug-2018	✗
Soil Glass Jar - Unpreserved (EP071) BH104_0.2-0.3	**31-Jul-2018**	**05-Sep-2018**	14-Aug-2018	✗	**05-Sep-2018**	15-Oct-2018	✓
Soil Glass Jar - Unpreserved (EP080) BH104_0.2-0.3	**31-Jul-2018**	**05-Sep-2018**	14-Aug-2018	✗	**06-Sep-2018**	14-Aug-2018	✗

Matrix: **SOIL**

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

Method **Container** / Client Sample ID(s)		**Sample Date**	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	**Date analysed**	Due for analysis	Evaluation
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080)								
BH101_0.0-0.2,	BH101_0.45-0.5	**29-Aug-2018**	**05-Sep-2018**	12-Sep-2018	✓	**06-Sep-2018**	12-Sep-2018	✓
Soil Glass Jar - Unpreserved (EP080)								
BH301_0.0-0.2, BH302_0.0-0.2, BH306_0.0-0.2, BHA302_0.0-0.2, BHA304_0.0-0.2,	BH301_0.45-0.5, BH302_0.2-0.3, BH306_0.2-0.3, BHA302_0.45-0.5, BHA304_0.45-0.5	**30-Aug-2018**	**05-Sep-2018**	13-Sep-2018	✓	**06-Sep-2018**	13-Sep-2018	✓
Soil Glass Jar - Unpreserved (EP080)								
BH104_0.0-0.2,	BH104_0.2-0.3	**31-Jul-2018**	**05-Sep-2018**	14-Aug-2018	✗	**06-Sep-2018**	14-Aug-2018	✗

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	3	20	**15.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH field/fox	EA003	6	56	**10.71**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	3	25	**12.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	3	25	**12.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	3	22	**13.64**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	2	20	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	2	20	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	2	20	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
pH field/fox	EA003	SOIL	In house: Referenced to Ahern et al 1998 - determined on a 1:5 soil/water extract designed to simulate field measured pH and pH after the extract has been oxidised with peroxide.
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504,505)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Sample Compositing	* EN020	SOIL	Equal weights of each original soil are taken, then mixed and homogenised. The combined mixture is labelled as a new sample.
Drying only	EN020D	SOIL	In house

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

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Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com

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Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: GHD
OFFICE: Newcastle
PROJECT: 2219573
ORDER NUMBER:
PROJECT MANAGER: Alison Monkley **CONTACT PH:** 49799999
SAMPLER: Julian Fowler **SAMPLER MOBILE:** 0466049181
COC emailed to ALS? (YES / NO) **EDD FORMAT (or default):** Esdat
Email Reports to (will default to PM if no other addresses are listed): Alison, ghdlab reports, ntl.car
Email Invoice to (will default to PM if no other addresses are listed): ap-fss@ghd.com

TURNAROUND REQUIREMENTS :
(Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☑ Standard TAT **(List due date):**
☐ Non Standard or urgent TAT **(List due date):**

ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)
COC: [✓ 1] 2 3 4 5 6 7
OF: 1 2 3 4 [✓ 5] 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact?
Free ice / frozen ice bricks present upon receipt?
Random Sample Temperature on Receipt:
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Julian Fowler	K Jones		MC
DATE/TIME: 31/8/18 1305	DATE/TIME: 31/8/18 1:06pm	DATE/TIME:	DATE/TIME: 31/8/18 7:30pm

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS									Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	BH108_0.0-0.2	22/8/18	S	B	1									Please hold all samples.
2	BH108_0.2-0.3	↓	S	B	↓									
3	BH108_0.5-0.6	↓	S	B	↓									
4	BH101_0.0-0.2	29/8/18	↓	Jar, B	2									
5	BH101_0.2-0.3	↓	↓	↓ ↓	2									
6	BH101_0.45-0.5	↓	↓	↓ ↓	2									
7	BH101-0.95-1.0	↓	↓	↓ ↓	2									
8	BH101_1.45-1.5	↓	↓	↓	1									
9	FD6	↓	↓	↓	1									
10	BH301_0.0-0.2	30/8/18	↓	↓ B	2									
11	BH301-0.2-0.3	↓	↓	↓ B	2									
12	BH301-0.45-0.5	↓	↓	↓, ↓, ASS	3									
13	BH301_0.95-1.0	↓	↓	, ASS	3									
14	BH301_1.45-1.5	↓	↓	↓	1									
15	BH301_2.0-2.1	↓	↓	↓	1									
16	BH301_2.45-2.5	↓	↓	↓	1									
17	BH301_3.0-3.1	↓	↓	↓	1									
18	BH301_3.5-3.6	↓	↓	↓	1									
				TOTAL										

LAB OF ORIGIN:
NEWCASTLE

E-MAILED

Environmental Division
Sydney
Work Order Reference
ES1825728

Telephone: +61-2-8764 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

client requested - ASB bags @ EN

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Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: GHD
OFFICE: Newcastle
PROJECT: 2219573
ORDER NUMBER:
PROJECT MANAGER: Alison Monkley
CONTACT PH: 49799999
SAMPLER: Julian Fowler
SAMPLER MOBILE: 0466049181
COC emailed to ALS? (YES / NO)
EDD FORMAT (or default): Esdat
Email Reports to (will default to PM if no other addresses are listed): Alison, ghdlab reports, ntl.car
Email Invoice to (will default to PM if no other addresses are listed): ap-fss@ghd.com

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☒ Standard TAT **(List due date):**
☐ Non Standard or urgent TAT **(List due date):**

ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)
COC: 1 [✓ 2] 3 4 5 6 7
OF: 1 2 3 4 [✓ 5] 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: °C
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Julian Fowler	KJong		MC
DATE/TIME: 31/8/17 1305	DATE/TIME: 31/8/18 1.06pm	DATE/TIME:	DATE/TIME: 31/8/18 7:30pm

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS									Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
19	BH301_3.95-4.0	30/8/18	S	ASS	1									
20	BH301_4.45-4.5				1									
21	BH301_4.9-5.0				1									
22	[redacted] FD8			Jar	1									
23	BH302_0.0-0.2			, B	2									
24	BH302_0.2-0.3				2									
25	BH302_0.45-0.5			, , ASS	3									
26	BH302_0.95-1.0				2									
27	BH302_1.45-1.5				1									
28	BH302_2.0-2.1				1									
29	BH302_2.45-2.5				1									
30	BH302_2.95-3.0				1									
31	BH302_3.5-3.6				1									
32	BH302-3.95-4.0				1									
33	BH302-4.45-4.5				1									
34	BH302-4.9-5.0				1									
35	[redacted] FD7				1									
36	BH306_0.0-0.2			Jar , B	2									
				TOTAL										

LAB OF ORIGIN:
[illegible]

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V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
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Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com

☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: GHD

OFFICE: Newcastle

PROJECT: 2219573

ORDER NUMBER:

PROJECT MANAGER: Alison Monkley **CONTACT PH:** 49799999

SAMPLER: Julian Fowler **SAMPLER MOBILE:** 0466049181

COC emailed to ALS? (YES / NO) **EDD FORMAT (or default):** Esdat

Email Reports to (will default to PM if no other addresses are listed): Alison, ghdlab reports, ntl.car

Email Invoice to (will default to PM if no other addresses are listed): ap-fss@ghd.com

TURNAROUND REQUIREMENTS :
(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

☑ Standard TAT (List due date):

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ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)

COC:	1	2	[✓ 3]	4	5	6	7
OF:	1	2	3	4	[✓ 5]	6	7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No

Free ice / frozen ice bricks present upon receipt? Yes No

Random Sample Temperature on Receipt:

Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Julian Fowler	KJones		Me
DATE/TIME: 31/8/18 1305	DATE/TIME: 31/8/18 1:08pm	DATE/TIME:	DATE/TIME: 31/8/18 7:30pm

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS									Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
37	BH306_0.2-0.3	30/8/18	S	Jar, B	2									
38	BH306_0.45-0.5			↓, ↓, ASS	3									
39	BH306_0.95-1.0				1									
40	BH306 1.45-1.5				1									
41	BH306_2.0-2.1				1									
42	BH306_2.45-2.5				1									
43	BH306_3.0-3.1				1									
44	BH306_3.5-3.6				1									
45	BH306_3.9-4.0				1									
46	BH306_4.45-4.5				1									
47	FD9			Jar	1									
48	BHA302_0.0-0.2			Jar, B	2									
49	BHA302_0.2-0.3				2									
50	BHA302_0.45-0.5			↓, ↓, ASS	3									
51	BHA302_0.95-1.0				1									
52	BHA 302_1.45-1.5				1									
53	BHA 302_2.0-21				1									
54	BHA 302_2.45-2.5	↓	↓	↓	1									
				TOTAL										

LAB OF ORIGIN: NEWCASTLE

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SAMPLER: Julian Fowler
SAMPLER MOBILE: 0466049181
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FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: °C
Other comment:

RELINQUISHED BY: Julian Fowler
DATE/TIME: 31/8/18 1305

RECEIVED BY: KDne
DATE/TIME: 31/8/18 1.06pm

RELINQUISHED BY:
DATE/TIME:

RECEIVED BY: MC
DATE/TIME: 31/8/18 7:30pm

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS									Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
55	BHA302_3.0-3.1	30/8/18	S	ASS	1									
56	BHA302_3.5-3.6				1									
57	BHA302_3.9-4.0				1									
58	BHA302_4.45-4.5				1									
59	BHA302_4.9-5.0				1									
60	FD10			Jar	1									
61	BHA304_0.0-0.2			B	2									
62	BHA304_0.2-0.3				2									
63	BHA304_0.45-0.5			ASS	3									
64	BHA304_0.95-1.0				3									
65	BHA304_1.5-1.6				1									
66	BHA304_2.0-2.1				1									
67	BHA304_2.45-2.5				1									
68	BHA304_3.0-3.1				1									
69	BHA304_3.5-3.6				1									
70	BHA304_3.95-4.0				1									
71	BHA304_4.5-4.6				1									
72	BHA304_4.9-5.0				1									
				TOTAL										

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Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Asb # 1, 4, 61, 74
ASS 13 - 18, 26 - 34,
38 - 46,
49 - 59
64 - 72

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Ph: 07 7471 5600 E: gladstone@alsglobal.com

☐MACKAY 78 Harbour Road Mackay QLD 4740
Ph: 07 4944 0177 E: mackay@alsglobal.com

☐MELBOURNE 2-4 Westall Road Springvale VIC 3171
Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

☐MUDGEE 27 Sydney Road Mudgee NSW 2850
Ph: 02 6372 5735 E: mudgee.mail@alsglobal.com

☑NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304
Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com

☐NOWRA 4/13 Geary Place North Nowra NSW 2541
Ph: 024423 2063 E: nowra@alsglobal.com

☐PERTH 10 Hod Way Malaga WA 6090
Ph: 08 9209 7655 E: samples.perth@alsglobal.com

☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164
Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818
Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com

☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: GHD
OFFICE: Newcastle
PROJECT: 2219573
ORDER NUMBER:
PROJECT MANAGER: Alison Monkley
CONTACT PH: 49799999
SAMPLER: Julian Fowler
SAMPLER MOBILE: 0466049181
COC emailed to ALS? (YES / NO)
EDD FORMAT (or default): Esdat
Email Reports to (will default to PM if no other addresses are listed): Alison, ghdlab reports, ntl.car
Email Invoice to (will default to PM if no other addresses are listed): ap-fss@ghd.com
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS :
(Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☑ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)
COC: [✓ 1] 2 3 4 5 6 7
OF: 1 2 3 4 [✓ 5] 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact?
Free ice / frozen ice bricks present upon receipt?
Random Sample Temperature on Receipt: 0.3
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Julian Fowler	KDone		
DATE/TIME: 31/8/18 1305	DATE/TIME: 31/8/18 1:06pm	DATE/TIME:	DATE/TIME:

ALS USE | SAMPLE DETAILS MATRIX: SOLID (S) WATER (W) | CONTAINER INFORMATION

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)
Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	TPH/BTEXN PAH, 8 metals	Asbestos Presence/absence	ASS Screening	Comp 2 (OCPs, PCB)	Comp 3 (OCPs PCB)				Additional Information Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	BH108_0.0-0.2	22/8/18	S	B	1		X							Please hold all samples
2	BH108_0.2-0.3	↓	S	B	↓									ASS Brisbane
3	BH108_0.5-0.6	↓	S	B	↓									
4	BH101_0.0-0.2	29/8/18	↓	Jar, B	2	X	X		X					
5	BH101_0.2-0.3	↓	↓	↓ ↓	2									
6	BH101_0.45-0.5	↓	↓	↓ ↓	2	X								
7	BH101-0.95-1.0	↓	↓	↓ ↓	2									
8	BH101_1.45-1.5	↓	↓	↓	1									
9	FD6	↓	↓	↓	1									
10	BH301_0.0-0.2	30/8/18	↓	↓ B	2	X				X				
11	BH301_0.2-0.3	↓	↓	↓ B	2	~~X~~								
12	BH301-0.45-0.5	↓	↓	↓, ↓, ASS	3	X								
13	BH301_0.95-1.0	↓	↓	, ASS	3			X						
14	BH301_1.45-1.5	↓	↓	↓	1			X						
15	BH301_2.0-2.1	↓	↓	↓	1			X						
16	BH301_2.45-2.5	↓	↓	↓	1			X						
17	BH301_3.0-3.1	↓	↓	↓	1			X						
18	BH301_3.5-3.6	↓	↓	↓	1			X						
				TOTAL										

[✓ Subcon] / Forward Lab / Split WO
Lab / Analysis:
Organised By / Date:
Relinquished By / Date:
Connote / Courier:
WO No:
Attach By PO / Internal Sheet:

Environmental Division
Sydney
Work Order Reference
ES1825728

Telephone : + 61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

☐ ADELAIDE 21 Burma Road Pooraka SA 5095
Ph: 08 8359 0890 E: adelaide@alsglobal.com

☐ BRISBANE 32 Shand Street Stafford QLD 4053
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CLIENT: GHD
OFFICE: Newcastle
PROJECT: 2219573
ORDER NUMBER:
PROJECT MANAGER: Alison Monkley
CONTACT PH: 49799999
SAMPLER: Julian Fowler
SAMPLER MOBILE: 0466049181
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Email Reports to (will default to PM if no other addresses are listed): Alison, ghdlab reports, ntl.car
Email Invoice to (will default to PM if no other addresses are listed): ap-fss@ghd.com
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS :
(Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☑ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)
COC: 1 [✓ 2] 3 4 5 6 7
OF: 1 2 3 4 [✓ 5] 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: °C
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Julian Fowler	KJong		
DATE/TIME: 31/8/18 1305	DATE/TIME: 31/8/18 1.06/12	DATE/TIME:	DATE/TIME:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	TRH/BTEXN PAH, 8 metals	Asbestos presence/absence	ASS Screening	Comp 2 (OCP's PCB)	Comp 3 (OCP's, PCB)				Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
19	BH301_3.95-4.0	30/8/18	S	ASS	1									
20	BH301_4.45-4.5	↓	↓	↓	1									
21	BH301_4.9-5.0				1									
22	[redacted] FD8			Jar	1									
23	BH302_0.0-0.2			, B	2	X	✓			X				
24	BH302_0.2-0.3			,	2	X	✓							
25	BH302_0.45-0.5			, ASS	3									
26	BH302_0.95-1.0			↓	2			X	✓					
27	BH302_1.45-1.5				1			X	✓					
28	BH302_2.0-2.1				1			X	✓					
29	BH302_2.45-2.5				1			X	✓					
30	BH302_2.95-3.0				1			X	✓					
31	BH302_3.5-3.6				1			X	✓					
32	BH302_3.95-4.0				1			X	✓					
33	BH302_4.45-4.5				1			X	✓					
34	BH302_4.9-5.0				1			X	✓					
35	[redacted] FD7			↓	1									
36	BH306_0.0-0.2	↓	↓	Jar , B	2	X	✓			X				
				TOTAL										

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

ALS Environmental

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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☐ WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: GHD

OFFICE: Newcastle

PROJECT: 2219573

ORDER NUMBER:

PROJECT MANAGER: Alison Monkley

CONTACT PH: 49799999

SAMPLER: Julian Fowler

SAMPLER MOBILE: 0466049181

COC emailed to ALS? (YES / NO)

EDD FORMAT (or default): Esdat

Email Reports to (will default to PM if no other addresses are listed): Alison, ghdlab reports, ntl.car

Email Invoice to (will default to PM if no other addresses are listed): ap-fss@ghd.com

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

☑ Standard TAT (List due date):

☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)

COC: 1 2 [✓ 3] 4 5 6 7

OF: 1 2 3 4 [✓ 5] 6 7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Julian Fowler	KJones		
DATE/TIME: 31/8/18 1305	DATE/TIME: 31/8/18 1:08pm	DATE/TIME:	DATE/TIME:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	TPH/BTEXN PAH, 8 metals	Asbestos presence/absence	ASS screening	Comp 2 (OCP's, PCB)	Comp 3 (OCP's, PCB)				Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
37	BH306_0.2-0.3	30/8/18	S	Jar, B	2	X								
38	BH306_0.45-0.5	↓	↓	↓, ↓, ASS	3		✓	X						
39	BH306_0.95-1.0				1			X						
40	BH306_1.45-1.5				1			X						
41	BH306_2.0-2.1				1			X						
42	BH306_2.45-2.5				1			X		✓				
43	BH306_3.0-3.1				1			X						
44	BH306_3.5-3.6				1			X						
45	BH306_3.9-4.0				1			X						
46	BH306_4.45-4.5			↓	1			X						
47	FD9			Jar	1									
48	BHA302_0.0-0.2			Jar, B	2	X	✓							
49	BHA302_0.2-0.3				2			X	✓					
50	BHA302_0.45-0.5			↓, ↓, ASS	3	X		X	✓					
51	BHA302_0.95-1.0				1		✓	X						
52	BHA302_1.45-1.5				1			X						
53	BHA302_2.0-2.1				1			X						
54	BHA302_2.45-2.5	↓	↓	↓	1			X						
				TOTAL										

Water Container Codes; P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory:
please tick →

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☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: GHD

OFFICE: Newcastle

PROJECT: 2219573

ORDER NUMBER:

PROJECT MANAGER: Alison Monkley

CONTACT PH: 49799999

SAMPLER: Julian Fowler

SAMPLER MOBILE: 0466049181

COC emailed to ALS? (YES / NO)

EDD FORMAT (or default): Esdat

Email Reports to (will default to PM if no other addresses are listed): Alison, ghdlab reports, ntl.car

Email Invoice to (will default to PM if no other addresses are listed): ap-fss@ghd.com

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS :
(Standard TAT may be longer for some tests e.g., Ultra Trace Organics)

☑ Standard TAT (List due date):

☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)

COC: 1 2 3 [✓ 4] 5 6 7

OF: 1 2 3 4 [✓ 5] 6 7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: ℃

Other comment:

RELINQUISHED BY: Julian Fowler
DATE/TIME: 31/8/18 1305

RECEIVED BY: KDNe
DATE/TIME: 31/8/18 1.06pm

RELINQUISHED BY:
DATE/TIME:

RECEIVED BY:
DATE/TIME:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	TPH/BTEXN PAH, 8metals	Asbestos presence/absence	ASS screening	Comp 2 (OCP's, PCB)	Comp 3 (OCP's, PCB)				Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
55	BHA302_3.0-3.1	30/8/18	S	ASS	1			X						
56	BHA302_3.5-3.6				1			X						
57	BHA302_3.9-4.0				1			X						
58	BHA302_4.45-4.5				1			X						
59	BHA302_4.9-5.0			↓	1			X						
60	FD10	↓		Jar	1									
61	BHA304_0.0-0.2			B	2	X	X	-						
62	BHA304_0.2-0.3				2									
63	BHA304_0.45-0.5			ASS	3	X								
64	BHA304_0.95-1.0			↓	3			X						
65	BHA304_1.5-1.6				1			X						
66	BHA304_2.0-2.1				1			X						
67	BHA304_2.45-2.5				1			X						
68	BHA304_3.0-3.1				1			X						
69	BHA304_3.5-3.6				1			X						
70	BHA304_3.95-4.0				1			X						
71	BHA304_4.5-4.6				1			X						
72	BHA304_4.9-5.0	↓	↓	↓	1			X	-					
TOTAL														

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Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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SAMPLER MOBILE: 0466049181
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TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)
☑ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)
COC: 1 2 3 4 [✓ 5] 6 7
OF: 1 2 3 4 [✓ 5] 6 7 8

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: °C
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Julie Fowl	KOng		
DATE/TIME: 31/8/18 1305	DATE/TIME: 31/8/18 1.06pm	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
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73	FD11	30/8/18	S	Jar	1									
74	BH104_0.0-0.2	31/8/18	S	↓ , B	2	X	X		X					
75	BH104_0.2-0.3	↓	S	, ↓	2	X								
76	BH104_0.45-0.5	↓	S	, ↓	2									
77	BH104 0.95-1.0	↓	S	, ↓	2									
78	FD12	↓	S	↓	1									
TOTAL														

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Environmental

CERTIFICATE OF ANALYSIS

Work Order : **ES1826547**
Client : **GHD PTY LTD**
Contact : MS ALISON MONKLEY
Address : PO BOX 5403
NEWCASTLE WEST NSW, AUSTRALIA 2302
Telephone : ----
Project : 2219573
Order number :
C-O-C number : ----
Sampler : JULIAN FOWLER
Site :
Quote number : EN/005/18
No. of samples received : 28
No. of samples analysed : 11

Page : 1 of 12
Laboratory : Environmental Division Sydney
Contact : Brenda Hong
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : (02) 8784 8504
Date Samples Received : 07-Sep-2018 16:18
Date Analysis Commenced : 18-Sep-2018
Issue Date : 22-Sep-2018 11:49

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
- 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*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos, Mayfield West, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

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

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.

- EG035: Positive Hg result for ES1826547 #4 has been confirmed by reanalysis.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl - Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H+ + Al3+).
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**TP101_0.0-0.2**	**TP101_0.5-0.6**	**TP102_0.0-0.2**	**TP103_0.0-0.2**	**TP104_0.0-0.2**
			Client sampling date / time	06-Sep-2018 00:00	06-Sep-2018 00:00	06-Sep-2018 00:00	06-Sep-2018 00:00	06-Sep-2018 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES1826547-001**	**ES1826547-003**	**ES1826547-004**	**ES1826547-007**	**ES1826547-011**
				Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	**6.0**	**6.5**	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**3.0**	----	**11.0**	**5.9**	<1.0
ED007: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	**2.0**	**0.3**	----	----	----
Exchangeable Magnesium	----	0.1	meq/100g	**0.4**	<0.1	----	----	----
Exchangeable Potassium	----	0.1	meq/100g	<0.1	<0.1	----	----	----
Exchangeable Sodium	----	0.1	meq/100g	<0.1	<0.1	----	----	----
Cation Exchange Capacity	----	0.1	meq/100g	**2.5**	**0.4**	----	----	----
Exchangeable Sodium Percent	----	0.1	%	**1.4**	**2.4**	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	----	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	----	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	<2	----	**4**	<2	<2
Copper	7440-50-8	5	mg/kg	**6**	----	**61**	<5	**10**
Lead	7439-92-1	5	mg/kg	**6**	----	**16**	<5	<5
Nickel	7440-02-0	2	mg/kg	<2	----	<2	<2	<2
Zinc	7440-66-6	5	mg/kg	**36**	----	**38**	<5	**29**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	**0.3**	<0.1	<0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**TP101_0.0-0.2**	**TP101_0.5-0.6**	**TP102_0.0-0.2**	**TP103_0.0-0.2**	**TP104_0.0-0.2**
			Client sampling date / time	06-Sep-2018 00:00	06-Sep-2018 00:00	06-Sep-2018 00:00	06-Sep-2018 00:00	06-Sep-2018 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES1826547-001**	**ES1826547-003**	**ES1826547-004**	**ES1826547-007**	**ES1826547-011**
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	**0.6**	----	**0.6**	**0.6**	**0.6**
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	**1.2**	----	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	----	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	----	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	----	<100	<100	<100
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	<50	----	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	<10	<10	<10
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	<10	----	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	----	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	----	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	----	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	<50	----	<50	<50	<50
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	<50	----	<50	<50	<50
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
^ **Sum of BTEX**	----	0.2	mg/kg	<0.2	----	<0.2	<0.2	<0.2
^ **Total Xylenes**	----	0.5	mg/kg	<0.5	----	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	----	<1	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**85.2**	----	**79.7**	**78.0**	**77.9**

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Client sample ID	**TP101_0.0-0.2**	**TP101_0.5-0.6**	**TP102_0.0-0.2**	**TP103_0.0-0.2**	**TP104_0.0-0.2**
			Client sampling date / time	06-Sep-2018 00:00	06-Sep-2018 00:00	06-Sep-2018 00:00	06-Sep-2018 00:00	06-Sep-2018 00:00
Compound	CAS Number	LOR	Unit	**ES1826547-001**	**ES1826547-003**	**ES1826547-004**	**ES1826547-007**	**ES1826547-011**
				Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates - Continued								
2-Chlorophenol-D4	93951-73-6	0.5	%	**89.3**	----	**82.5**	**82.6**	**81.9**
2.4.6-Tribromophenol	118-79-6	0.5	%	**75.9**	----	**76.7**	**72.8**	**65.4**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**99.0**	----	**90.8**	**91.0**	**91.3**
Anthracene-d10	1719-06-8	0.5	%	**94.1**	----	**86.5**	**88.0**	**87.2**
4-Terphenyl-d14	1718-51-0	0.5	%	**82.6**	----	**76.1**	**75.9**	**75.9**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**95.1**	----	**109**	**103**	**109**
Toluene-D8	2037-26-5	0.2	%	**94.6**	----	**108**	**98.5**	**104**
4-Bromofluorobenzene	460-00-4	0.2	%	**95.9**	----	**110**	**103**	**106**

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**TP105_0.0-0.2**	**TP105_0.6-0.7**	**TP106_0.0-0.2**	**FD20**	**COMP 4**
			Client sampling date / time	06-Sep-2018 00:00	06-Sep-2018 00:00	06-Sep-2018 00:00	06-Sep-2018 00:00	18-Sep-2018 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES1826547-014**	**ES1826547-016**	**ES1826547-018**	**ES1826547-022**	**ES1826547-027**
				Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	**6.6**	**6.7**	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	<1.0	----	**14.9**	**13.8**	**5.3**
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	**No**	----	----
Asbestos (Trace)	1332-21-4	5	Fibres	----	----	**No**	----	----
Asbestos Type	1332-21-4	-	--	----	----	**-**	----	----
Sample weight (dry)	----	0.01	g	----	----	**348**	----	----
APPROVED IDENTIFIER:	----	-	--	----	----	**C.OWLER**	----	----
ED007: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	**0.5**	**6.9**	----	----	----
Exchangeable Magnesium	----	0.1	meq/100g	**0.2**	**1.4**	----	----	----
Exchangeable Potassium	----	0.1	meq/100g	<0.1	<0.1	----	----	----
Exchangeable Sodium	----	0.1	meq/100g	<0.1	**0.2**	----	----	----
Cation Exchange Capacity	----	0.1	meq/100g	**0.8**	**8.4**	----	----	----
Exchangeable Sodium Percent	----	0.1	%	**3.8**	**2.0**	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	----	**25**	**20**	----
Cadmium	7440-43-9	1	mg/kg	<1	----	<1	<1	----
Chromium	7440-47-3	2	mg/kg	<2	----	**5**	**5**	----
Copper	7440-50-8	5	mg/kg	<5	----	**194**	**206**	----
Lead	7439-92-1	5	mg/kg	<5	----	**246**	**287**	----
Nickel	7440-02-0	2	mg/kg	<2	----	<2	**3**	----
Zinc	7440-66-6	5	mg/kg	**21**	----	**3130**	**3740**	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	<0.1	<0.1	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	----	----	----	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	----	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	----	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg	----	----	----	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	----	----	----	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg	----	----	----	----	<0.05

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**TP105_0.0-0.2**	**TP105_0.6-0.7**	**TP106_0.0-0.2**	**FD20**	**COMP 4**
			Client sampling date / time	06-Sep-2018 00:00	06-Sep-2018 00:00	06-Sep-2018 00:00	06-Sep-2018 00:00	18-Sep-2018 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES1826547-014**	**ES1826547-016**	**ES1826547-018**	**ES1826547-022**	**ES1826547-027**
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Heptachlor	76-44-8	0.05	mg/kg	----	----	----	----	<0.05
Aldrin	309-00-2	0.05	mg/kg	----	----	----	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	----	----	----	<0.05
^ **Total Chlordane (sum)**	----	0.05	mg/kg	----	----	----	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	----	----	----	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	----	----	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	----	----	----	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg	----	----	----	----	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	----	----	----	----	<0.05
Endrin	72-20-8	0.05	mg/kg	----	----	----	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	----	----	----	<0.05
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg	----	----	----	----	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	----	----	----	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	----	----	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	----	----	----	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	----	----	----	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	----	----	----	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	----	----	----	----	<0.2
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg	----	----	----	----	<0.05
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg	----	----	----	----	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	<0.5	<0.5	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**TP105_0.0-0.2**	**TP105_0.6-0.7**	**TP106_0.0-0.2**	**FD20**	**COMP 4**
			Client sampling date / time	06-Sep-2018 00:00	06-Sep-2018 00:00	06-Sep-2018 00:00	06-Sep-2018 00:00	18-Sep-2018 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES1826547-014**	**ES1826547-016**	**ES1826547-018**	**ES1826547-022**	**ES1826547-027**
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	**0.6**	----	**0.6**	**0.6**	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	**1.2**	----	**1.2**	**1.2**	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg	<100	----	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	<100	<100	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	<50	----	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	<10	<10	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	<10	----	<10	<10	----
>C10 - C16 Fraction	----	50	mg/kg	<50	----	<50	<50	----
>C16 - C34 Fraction	----	100	mg/kg	<100	----	<100	<100	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	<100	<100	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	<50	----	<50	<50	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	<50	----	<50	<50	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
^ **Sum of BTEX**	----	0.2	mg/kg	<0.2	----	<0.2	<0.2	----
^ **Total Xylenes**	----	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg	<1	----	<1	<1	----
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	----	----	**105**

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**TP105_0.0-0.2**	**TP105_0.6-0.7**	**TP106_0.0-0.2**	**FD20**	**COMP 4**
			Client sampling date / time	06-Sep-2018 00:00	06-Sep-2018 00:00	06-Sep-2018 00:00	06-Sep-2018 00:00	18-Sep-2018 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES1826547-014**	**ES1826547-016**	**ES1826547-018**	**ES1826547-022**	**ES1826547-027**
				Result	Result	Result	Result	Result
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	----	----	----	----	**81.8**
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	----	----	----	----	**80.3**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**78.5**	----	**74.8**	**74.1**	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**82.0**	----	**78.7**	**77.7**	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**65.2**	----	**66.0**	**65.3**	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**91.2**	----	**87.8**	**86.8**	----
Anthracene-d10	1719-06-8	0.5	%	**86.8**	----	**83.8**	**81.4**	----
4-Terphenyl-d14	1718-51-0	0.5	%	**75.7**	----	**73.2**	**71.7**	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**126**	----	**113**	**112**	----
Toluene-D8	2037-26-5	0.2	%	**119**	----	**109**	**104**	----
4-Bromofluorobenzene	460-00-4	0.2	%	**124**	----	**108**	**105**	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**COMP 5**	**----**	**----**	**----**	**----**
			Client sampling date / time	18-Sep-2018 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1826547-028**	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**15.1**	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	----	----	----
^ **Total Chlordane (sum)**	----	0.05	mg/kg	<0.05	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	----	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	----	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	----	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	----	----	----	----
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	**118**	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**87.1**	----	----	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL)**			Client sample ID	**COMP 5**	**----**	**----**	**----**	**----**
			Client sampling date / time	18-Sep-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	**ES1826547-028**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**89.9**	**----**	**----**	**----**	**----**

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	TP106_0.0-0.2 - 06-Sep-2018 00:00	Mid brown sandy soil

Surrogate Control Limits

Sub-Matrix: **SOIL**

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

QUALITY CONTROL REPORT

Work Order	: **ES1826547**	Page	: 1 of 9
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS ALISON MONKLEY	Contact	: Brenda Hong
Address	: PO BOX 5403 NEWCASTLE WEST NSW, AUSTRALIA 2302	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: (02) 8784 8504
Project	: 2219573	Date Samples Received	: 07-Sep-2018
Order number	:	Date Analysis Commenced	: 18-Sep-2018
C-O-C number	: ----	Issue Date	: 22-Sep-2018
Sampler	: JULIAN FOWLER		
Site	:		
Quote number	: EN/005/18		
No. of samples received	: 28		
No. of samples analysed	: 11		

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 Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos, Mayfield West, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA002: pH 1:5 (Soils) (QC Lot: 1936505)									
ES1826044-014	Anonymous	EA002: pH Value	----	0.1	pH Unit	6.3	6.2	0.00	0% - 20%
ES1827443-001	Anonymous	EA002: pH Value	----	0.1	pH Unit	5.9	5.8	0.00	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1937107)									
ES1826044-003	Anonymous	EA055: Moisture Content	----	0.1	%	21.3	20.3	4.94	0% - 20%
ES1826547-007	TP103_0.0-0.2	EA055: Moisture Content	----	0.1	%	5.9	5.7	3.00	No Limit
ED007: Exchangeable Cations (QC Lot: 1941868)									
ES1826044-014	Anonymous	ED007: Exchangeable Sodium Percent	----	0.1	%	5.7	5.7	0.00	0% - 20%
		ED007: Exchangeable Calcium	----	0.1	meq/100g	4.6	4.5	0.00	0% - 20%
		ED007: Exchangeable Magnesium	----	0.1	meq/100g	2.7	2.6	0.00	0% - 20%
		ED007: Exchangeable Potassium	----	0.1	meq/100g	0.2	0.2	0.00	No Limit
		ED007: Exchangeable Sodium	----	0.1	meq/100g	0.4	0.4	0.00	No Limit
		ED007: Cation Exchange Capacity	----	0.1	meq/100g	7.9	7.8	0.00	0% - 20%
ES1827443-004	Anonymous	ED007: Exchangeable Sodium Percent	----	0.1	%	5.7	5.4	5.40	0% - 20%
		ED007: Exchangeable Calcium	----	0.1	meq/100g	<0.1	<0.1	0.00	No Limit
		ED007: Exchangeable Magnesium	----	0.1	meq/100g	0.8	0.8	0.00	No Limit
		ED007: Exchangeable Potassium	----	0.1	meq/100g	0.2	0.2	0.00	No Limit
		ED007: Exchangeable Sodium	----	0.1	meq/100g	<0.1	<0.1	0.00	No Limit
		ED007: Cation Exchange Capacity	----	0.1	meq/100g	1.0	1.0	0.00	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 1941966)									
ES1826547-001	TP101_0.0-0.2	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	6	7	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG005T: Total Metals by ICP-AES (QC Lot: 1941966) - continued									
ES1826547-001	TP101_0.0-0.2	EG005T: Lead	7439-92-1	5	mg/kg	6	6	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	36	39	8.69	No Limit
ES1827574-002	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	8	11	32.2	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	9	6	35.1	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	15	17	13.7	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	7	28.8	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1941965)									
ES1826547-001	TP101_0.0-0.2	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1827574-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 1937046)									
ES1827553-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1937045)									
ES1827553-001	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1937041)									
ES1826547-001	TP101_0.0-0.2	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1937041) - continued									
ES1826547-001	TP101_0.0-0.2	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1936161)									
ES1826044-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1826044-045	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1937040)									
ES1826547-001	TP101_0.0-0.2	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1936161)									
ES1826044-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1826044-045	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1937040)									
ES1826547-001	TP101_0.0-0.2	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080: BTEXN (QC Lot: 1936161)									
ES1826044-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080: BTEXN (QC Lot: 1936161) - continued									
ES1826044-001	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1826044-045	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED007: Exchangeable Cations (QCLot: 1941868)								
ED007: Exchangeable Calcium	----	0.1	meq/100g	<0.1	1 meq/100g	93.0	76	120
ED007: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.67 meq/100g	94.0	75	115
ED007: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.51 meq/100g	94.7	80	120
ED007: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.87 meq/100g	92.0	80	120
ED007: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	----	----	----	----
ED007: Exchangeable Sodium Percent	----	0.1	%	<0.1	----	----	----	----
EG005T: Total Metals by ICP-AES (QCLot: 1941966)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	96.3	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	96.7	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	81.5	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	97.3	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	95.5	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	95.1	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	106	80	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1941965)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	74.3	70	105
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1937046)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	103	62	126
EP068A: Organochlorine Pesticides (OC) (QCLot: 1937045)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	90.6	69	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	87.3	65	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	89.0	67	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	90.2	68	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	101	65	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	87.6	67	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	91.5	69	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	98.2	62	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	93.5	63	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	104	66	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	106	64	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	97.3	66	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	93.8	67	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	97.1	67	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	97.1	69	115

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 1937045) - continued								
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	98.0	69	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	89.9	56	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	99.6	62	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	104	66	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	104	64	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	103	54	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1937041)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	83.2	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	80.8	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	80.6	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	80.8	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	83.3	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	83.3	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	82.3	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	83.1	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	86.0	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	89.9	75	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	83.9	68	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	93.7	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	81.6	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	80.0	61	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	77.7	62	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	80.5	63	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1936161)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	86.2	68	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1937040)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	104	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	116	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	100	71	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1936161)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	90.3	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1937040)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	104	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	112	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	105	63	131
EP080: BTEXN (QCLot: 1936161)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	93.5	62	116

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	High
EP080: BTEXN (QCLot: 1936161) - continued								
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	93.2	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	94.2	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	91.5	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	93.6	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	96.1	63	119

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1941966)							
ES1826547-001	TP101_0.0-0.2	EG005T: Arsenic	7440-38-2	50 mg/kg	102	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	103	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	102	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	101	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	103	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	101	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	109	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1941965)							
ES1826547-001	TP101_0.0-0.2	EG035T: Mercury	7439-97-6	5 mg/kg	75.7	70	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1937046)							
ES1827553-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	100.0	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 1937045)							
ES1827553-001	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	85.6	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	73.9	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	107	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	107	70	130
		EP068: Endrin	72-20-8	2 mg/kg	93.4	70	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	80.0	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1937041)							
ES1826547-001	TP101_0.0-0.2	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	105	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	126	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1936161)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1936161) - continued							
ES1826044-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	75.4	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1937040)							
ES1826547-001	TP101_0.0-0.2	EP071: C10 - C14 Fraction	----	523 mg/kg	115	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	127	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	129	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1936161)							
ES1826044-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	74.1	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1937040)							
ES1826547-001	TP101_0.0-0.2	EP071: >C10 - C16 Fraction	----	860 mg/kg	119	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	124	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	118	52	132
EP080: BTEXN (QCLot: 1936161)							
ES1826044-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	77.6	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	78.7	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	82.2	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	79.9	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	84.7	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	81.2	70	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1826547**	Page	: 1 of 7
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS ALISON MONKLEY	Telephone	: (02) 8784 8504
Project	: 2219573	Date Samples Received	: 07-Sep-2018
Site	:	Issue Date	: 22-Sep-2018
Sampler	: JULIAN FOWLER	No. of samples received	: 28
Order number	:	No. of samples analysed	: 11

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)	Date extracted	Due for extraction	**Days overdue**	Date analysed	Due for analysis	**Days overdue**
EA002: pH 1:5 (Soils)						
Soil Glass Jar - Unpreserved TP101_0.0-0.2, TP101_0.5-0.6, TP105_0.0-0.2, TP105_0.6-0.7	19-Sep-2018	13-Sep-2018	**6**	----	----	----

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method	***Sample Date***	Extraction / Preparation			Analysis		
Container / *Client Sample ID(s)*		***Date extracted***	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EA002: pH 1:5 (Soils)							
Soil Glass Jar - Unpreserved (EA002) TP101_0.0-0.2, TP101_0.5-0.6, TP105_0.0-0.2, TP105_0.6-0.7	**06-Sep-2018**	**19-Sep-2018**	13-Sep-2018	✗	**19-Sep-2018**	19-Sep-2018	✓
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) TP101_0.0-0.2, TP102_0.0-0.2, TP103_0.0-0.2, TP104_0.0-0.2, TP105_0.0-0.2, TP106_0.0-0.2, FD20	**06-Sep-2018**	**----**	----	----	**18-Sep-2018**	20-Sep-2018	✓
Soil Glass Jar - Unpreserved (EA055) COMP 4, COMP 5	**18-Sep-2018**	**----**	----	----	**18-Sep-2018**	02-Oct-2018	✓
EA200: AS 4964 - 2004 Identification of Asbestos in Soils							
Snap Lock Bag - ACM/Asbestos Grab Bag (EA200) TP106_0.0-0.2	**06-Sep-2018**	**----**	----	----	**19-Sep-2018**	05-Mar-2019	✓
ED007: Exchangeable Cations							
Soil Glass Jar - Unpreserved (ED007) TP101_0.0-0.2, TP101_0.5-0.6, TP105_0.0-0.2, TP105_0.6-0.7	**06-Sep-2018**	**20-Sep-2018**	04-Oct-2018	✓	**20-Sep-2018**	04-Oct-2018	✓

Matrix: **SOIL**

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

Method	*Sample Date*	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) TP101_0.0-0.2, TP102_0.0-0.2, TP103_0.0-0.2, TP104_0.0-0.2, TP105_0.0-0.2, TP106_0.0-0.2, FD20	**06-Sep-2018**	**20-Sep-2018**	05-Mar-2019	✓	**20-Sep-2018**	05-Mar-2019	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) TP101_0.0-0.2, TP102_0.0-0.2, TP103_0.0-0.2, TP104_0.0-0.2, TP105_0.0-0.2, TP106_0.0-0.2, FD20	**06-Sep-2018**	**20-Sep-2018**	04-Oct-2018	✓	**21-Sep-2018**	04-Oct-2018	✓
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066) COMP 4, COMP 5	**18-Sep-2018**	**18-Sep-2018**	02-Oct-2018	✓	**19-Sep-2018**	28-Oct-2018	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068) COMP 4, COMP 5	**18-Sep-2018**	**18-Sep-2018**	02-Oct-2018	✓	**19-Sep-2018**	28-Oct-2018	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) TP101_0.0-0.2, TP102_0.0-0.2, TP103_0.0-0.2, TP104_0.0-0.2, TP105_0.0-0.2, TP106_0.0-0.2, FD20	**06-Sep-2018**	**19-Sep-2018**	20-Sep-2018	✓	**20-Sep-2018**	29-Oct-2018	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) TP101_0.0-0.2, TP102_0.0-0.2, TP103_0.0-0.2, TP104_0.0-0.2, TP105_0.0-0.2, TP106_0.0-0.2, FD20	**06-Sep-2018**	**18-Sep-2018**	20-Sep-2018	✓	**19-Sep-2018**	20-Sep-2018	✓
Soil Glass Jar - Unpreserved (EP071) TP101_0.0-0.2, TP102_0.0-0.2, TP103_0.0-0.2, TP104_0.0-0.2, TP105_0.0-0.2, TP106_0.0-0.2, FD20	**06-Sep-2018**	**19-Sep-2018**	20-Sep-2018	✓	**20-Sep-2018**	29-Oct-2018	✓

Matrix: **SOIL**

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

Method *Container / Client Sample ID(s)*		*Sample Date*	*Extraction / Preparation*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP080)								
TP101_0.0-0.2, TP103_0.0-0.2, TP105_0.0-0.2, FD20	TP102_0.0-0.2, TP104_0.0-0.2, TP106_0.0-0.2,	**06-Sep-2018**	**18-Sep-2018**	20-Sep-2018	✓	**19-Sep-2018**	20-Sep-2018	✓
Soil Glass Jar - Unpreserved (EP071)								
TP101_0.0-0.2, TP103_0.0-0.2, TP105_0.0-0.2, FD20	TP102_0.0-0.2, TP104_0.0-0.2, TP106_0.0-0.2,	**06-Sep-2018**	**19-Sep-2018**	20-Sep-2018	✓	**20-Sep-2018**	29-Oct-2018	✓
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080)								
TP101_0.0-0.2, TP103_0.0-0.2, TP105_0.0-0.2, FD20	TP102_0.0-0.2, TP104_0.0-0.2, TP106_0.0-0.2,	**06-Sep-2018**	**18-Sep-2018**	20-Sep-2018	✓	**19-Sep-2018**	20-Sep-2018	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		*Count*		*Rate (%)*			*Quality Control Specification*
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Exchangeable Cations	ED007	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Exchangeable Cations	ED007	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Exchangeable Cations	ED007	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
pH (1:5)	EA002	SOIL	In house: Referenced to Rayment and Lyons 4A1 and APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3)
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Exchangeable Cations	ED007	SOIL	In house: Referenced to Rayment & Lyons (2011) Method 15A1. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 301)
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504,505)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Exchangeable Cations Preparation Method	ED007PR	SOIL	In house: Referenced to Rayment & Higginson (1992) method 15A1. A 1M NH4Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Sample Compositing	* EN020	SOIL	Equal weights of each original soil are taken, then mixed and homogenised. The combined mixture is labelled as a new sample.
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

ALS Environmental

CHAIN OF CUSTODY

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☐ADELAIDE 21 Burma Road Pooraka SA 5095
Ph: 08 8359 0890 E: adelaide@alsglobal.com

☐BRISBANE 32 Shand Street Stafford QLD 4053
Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680
Ph: 07 7471 5600 E: gladstone@alsglobal.com

☐MACKAY 78 Harbour Road Mackay QLD 4740
Ph: 07 4944 0177 E: mackay@alsglobal.com

☐MELBOURNE 2-4 Westall Road Springvale VIC 3171
Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

☐MUDGEE 27 Sydney Road Mudgee NSW 2850
Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com

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Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com

☐NOWRA 4/13 Geary Place North Nowra NSW 2541
Ph: 024423 2063 E: nowra@alsglobal.com

☐PERTH 10 Hod Way Malaga WA 6090
Ph: 08 9209 7655 E: samples.perth@alsglobal.com

☐SYDNEY 277 289 Woodpark Road Smithfield NSW 2164
Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818
Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com

☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: GHD
OFFICE: Newcastle
PROJECT: 2219573
ORDER NUMBER:
PROJECT MANAGER: Alison Monkley **CONTACT PH:** 49799999
SAMPLER: Julian Fowler **SAMPLER MOBILE:** 0466049181
COC emailed to ALS? (YES / NO) **EDD FORMAT (or default):** Esdat
Email Reports to (will default to PM if no other addresses are listed): Alison, ghdlab reports, ntl.car
Email Invoice to (will default to PM if no other addresses are listed): ap-fss@ghd.com

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☑ Standard TAT (**List due date**):
☐ Non Standard or urgent TAT (**List due date**):

ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)
COC: [✓ 1] 2 3 4 5 6 7
OF: 1 [✓ 2] 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No [✓ N/A]
Free ice / frozen ice bricks present upon receipt? Yes No [✓ N/A]
Random Sample Temperature on Receipt: 2.0 °C
Other comment:

RELINQUISHED BY: Julian Fowler	**RECEIVED BY:**	**RELINQUISHED BY:**	**RECEIVED BY:** MC
DATE/TIME: 7/9/18 1620	**DATE/TIME:** 7/9/18 4:17pm	**DATE/TIME:**	**DATE/TIME:** 7/9/18 7:50pm

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS									Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	TP101	6/9/18	S	Jar, B	2									Please hold
2	TP101				2									
3	TP101				2									
4	TP102				2									
5	TP102				2									
6	TP102			Jar	1									
7	TP103			Jar, B	2									
8	TP103				2									
9	TP103			Jar	1									
10	TP103			Jar	1									
11	TP104			Jar, B	2									
12	TP104			Jar, B	2									
13	TP104			Jar	1									
14	TP105			Jar, B	2									
15	TP105				2									
16	TP105				2									
17	TP105			Jar	1									
18	TP106			Jar, B	2									
				TOTAL										

LAB OF ORIGIN: NEWCASTLE

E-MAILED

Environmental Division
Sydney
Work Order Reference
ES1826547

Telephone : + 61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

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OF: 1 [✓ 2] 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt:
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Julian Fowler			ML
DATE/TIME: 7/9/18 1620	DATE/TIME:	DATE/TIME:	DATE/TIME: 7/9/18 7:30pm

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS									Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
19	TP106	6/9/18	S	Jar, B	2									Please hold
20	TP106			Jar, B	2									
21	TP106			Jar	1									
22	FD20			Jar	1									
23	FD21			Jar	1									
24	FD22			Jar	1									
25	TP106-0.75-0.8			Extra										
26	TP106-1.2-1.25													
				TOTAL										

E-MAILED

LAB OF ORIGIN: NEWCASTLE

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COC: [✓ 1] 2 3 4 5 6 7
OF: 1 [✓ 2] 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No [✓ N/A]
Free ice / frozen ice bricks present upon receipt? Yes No [✓ N/A]
Random Sample Temperature on Receipt: 2.0
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Julian Fowler			MC
DATE/TIME: 7/9/18 1620	DATE/TIME: 7/9/18 4:17pm	DATE/TIME:	DATE/TIME: 7/9/18 7:50pm

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS									Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	TP101-0.0-0.2	6/9/18	S	Jar, B	2									Please hold
2	TP101-0.2-0.3	↓	↓	↓	2									
3	TP101-0.5-0.6				2									
4	TP102-0.0-0.2				2									
5	TP102-0.2-0.3				2									
6	TP102-0.5-0.6			Jar	1									
7	TP103-0.0-0.2			Jar, B	2									
8	TP103-0.2-0.3			↓	2									
9	TP103-0.5-0.6			Jar	1									
10	TP103-1.0-1.1			Jar	1									
11	TP104-0.0-0.2			Jar, B	2									
12	TP104-0.2-0.3			Jar, B	2									
13	TP104-0.55-0.6			Jar	1									
14	TP105-0.0-0.2			Jar, B	2									
15	TP105-0.2-0.3			↓	2									
16	TP105-0.6-0.7				2									
17	TP105-1.0-1.1			Jar	1									
18	TP106-0.0-0.2			Jar, B	2									
				TOTAL										

LAB OF ORIGIN: NEWCASTLE

E-MAILED

Environmental Division
Sydney
Work Order Reference
ES1826547

Telephone : +61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095
Ph. 08 8359 0890 E. adelaide@alsglobal.com

☐BRISBANE 32 Shand Street Stafford QLD 4053
Ph: 07 3243 7222 E. samples.brisbane@alsglobal.com

☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680
Ph: 07 7471 5600 E: gladstone@alsglobal.com

☐MACKAY 78 Harbour Road Mackay QLD 4740
Ph: 07 4944 0177 E. mackay@alsglobal.com

☐MELBOURNE 2-4 Westall Road Springvale VIC 3171
Ph 03 8549 9600 E: samples.melbourne@alsglobal.com

☐MUDGEE 27 Sydney Road Mudgee NSW 2850
Ph: 02 6372 6735 E. mudgee.mail@alsglobal.com

☑NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304
Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com

☐NOWRA 4/13 Geary Place North Nowra NSW 2541
Ph: 024423 2063 E: nowra@alsglobal.com

☐PERTH 10 Hod Way Malaga WA 6090
Ph: 08 9209 7655 E: samples.perth@alsglobal.com

☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164
Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818
Ph: 07 4796 0600 E townsville.environmental@alsglobal.com

☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph. 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: GHD

OFFICE: Newcastle

PROJECT: 2219573

ORDER NUMBER:

PROJECT MANAGER: Alison Monkley **CONTACT PH:** 49799999

SAMPLER: Julian Fowler **SAMPLER MOBILE:** 0466049181

COC emailed to ALS? (YES / NO) **EDD FORMAT (or default):** Esdat

Email Reports to (will default to PM if no other addresses are listed): Alison, ghdlab reports, ntl.car

Email Invoice to (will default to PM if no other addresses are listed): ap-fss@ghd.com

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)

☑ Standard TAT (List due date):

☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)

COC: 1 [✓ 2] 3 4 5 6 7

OF: 1 [✓ 2] 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
			ML
DATE/TIME: 7/9/18 1620	DATE/TIME:	DATE/TIME:	DATE/TIME: 7/9/18 7:30pm

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

E-MAILED

LAB OF ORIGIN: NEWCASTLE

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS									Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
19	TP106 0.2_0.5	6/9/18	S	Jar, B	2									Please hold
20	TP106_0.5_0.6	↓	↓	Jar, B	2									
21	TP106_0.6-0.7			Jar	1									
22	FD20			Jar	1									
23	FD21			Jar	1									
24	FD22			Jar	1									
25	TP106-0.75_0.8			Extra										
26	TP106_1.2_1.25													
				TOTAL										

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Updated COC's 17/9/18 17:00

P 1

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☑NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: nowra@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: GHD
OFFICE: Newcastle
PROJECT: 2219573
ORDER NUMBER:
PROJECT MANAGER: Alison Monkley
CONTACT.PH: 49799999
SAMPLER: Julian Fowler
SAMPLER MOBILE: 0466049181
COC emailed to ALS? (YES / NO)
EDD FORMAT (or default): Esdat
Email Reports to (will default to PM if no other addresses are listed): Alison, ghdlab reports, nll.car
Email Invoice to (will default to PM if no other addresses are listed): ap-fss@ghd.com
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)
☑ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)
COC: [✓ 1] 2 3 4 5 6 7
OF: 1 [✓ 2] 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No [✓ N/A]
Free ice / frozen ice bricks present upon receipt? Yes No [✓ N/A]
Random Sample Temperature on Receipt: 2·[illegible] °C
Other comment:

RELINQUISHED BY: Julian Fowler
DATE/TIME: 7/9/18 1620

RECEIVED BY:
DATE/TIME: 7/9/18 4:17pm

RELINQUISHED BY:
DATE/TIME:

RECEIVED BY:
DATE/TIME:

Asbestos / Newcastle

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	TRH, BTEXN PAH, 8 metals	Asbestos presence/absence	[illegible]	Comp 4" (OCP + PCB)	Comp 5" (OCP + PCB)	pH, CEC			Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	TP101_0.0-0.2	6/9/18	S	Jar, B	2	X			X		X			
2	TP101_0.2-0.3				2									Please hold
3	TP101_0.5-0.6				2					X	X			
4	TP102_0.0-0.2				2	X								
5	TP102_0.2-0.3				2									
6	TP102_0.5-0.6			Jar	1									
7	TP103_0.0-0.2			Jar, B	2	X			X					
8	TP103_0.2-0.3				2									
9	TP103_0.5-0.6			Jar	1					X				
10	TP103_1.0-1.1			Jar	1									
11	TP104_0.0-0.2			Jar, B	2	X								
12	TP104_0.2-0.3			Jar, B	2									
13	TP104_0.55-0.6			Jar	1									
14	TP105_0.0-0.2			Jar, B	2	X			X		X			
15	TP105_0.2-0.3				2									
16	TP105_0.6-0.7				2					X	X			
17	TP105_1.0-1.1			Jar	1									
18	TP106_0.0-0.2			Jar, B	2	X	X		X					
				TOTAL										

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

Environmental Division
Sydney
Work Order Reference
ES1826547

Telephone : + 61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag

21/9 Updated COC's

17/9/18
17:00
p 1

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ ADELAIDE 21 Burma Road Pooraka SA 5095
Ph: 08 8359 0890 E: adelaide@alsglobal.com

☐ BRISBANE 32 Shand Street Stafford QLD 4053
Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

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Ph: 07 4944 0177 E: mackay@alsglobal.com

☐ MELBOURNE 2-4 Westall Road Springvale VIC 3171
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☐ MUDGEE 27 Sydney Road Mudgee NSW 2850
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Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

☐ TOWNSVILLE 14-15 Desma Court Bohle QLD 4818
Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com

☐ WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: GHD
OFFICE: Newcastle
PROJECT: 2219573
ORDER NUMBER:
PROJECT MANAGER: Alison Monkley
CONTACT PH: 49799999
SAMPLER: Julian Fowler
SAMPLER MOBILE: 0466049181
COC emailed to ALS? (YES / NO)
EDD FORMAT (or default): Esdat
Email Reports to (will default to PM if no other addresses are listed): Alison, ghdlab reports, ntl.car
Email Invoice to (will default to PM if no other addresses are listed): ap-fss@ghd.com
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)
☑ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)
COC: 1 [✓ 2] 3 4 5 6 7
OF: 1 [✓ 2] 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: °C
Other comment:

RELINQUISHED BY:
DATE/TIME: 7/9/18 1620

RECEIVED BY:
DATE/TIME:

RELINQUISHED BY:
DATE/TIME:

RECEIVED BY:
DATE/TIME:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	TRH, BTEXN PAH, 8 metals	Asbestos presence/absence		"Comp 4" (OCP + PCB)	"Comp 5" (OCP + PCB)	pH, CEC			Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
19	TP106_0.2-0.3	6/9/18	S	Jar, B	2									Please hold
20	TP106_0.6-0.7	↓	↓	Jar, B	2					X				
21	TP106_0.75-0.8	↓	↓	Jar	1									
22	FD20	↓	↓	Jar	1	X								
23	FD21	↓	↓	Jar	1									
24	FD22	↓	↓	Jar	1									
20	TP106_0.5-0.6													
25	TP106_0.75-0.8	}	extra											
26	TP106_1.2-1.25													
					TOTAL									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles, ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CERTIFICATE OF ANALYSIS

Work Order : **ES1826738**
Amendment : **1**
Client : **GHD PTY LTD**
Contact : MR BRIAN OBERDORF
Address : PO BOX 5403
NEWCASTLE WEST NSW, AUSTRALIA 2302
Telephone : ----
Project : 2219573
Order number : 2219573
C-O-C number : ----
Sampler : D.COOPER
Site :
Quote number : EN/005/18
No. of samples received : 7
No. of samples analysed : 7

Page : 1 of 4
Laboratory : Environmental Division Sydney
Contact : Brenda Hong
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : (02) 8784 8504
Date Samples Received : 11-Sep-2018 08:37
Date Analysis Commenced : 12-Sep-2018
Issue Date : 26-Sep-2018 18:38

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

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*
Ashesh Patel	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

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

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.

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**TP103 0.5-0.6M**	**TP103 1.0-1.1M**	**BH303 2.5-2.95M**	**BH304 0.5-0.95M**	**BH302 4.0-4.45M**
			Client sampling date / time	06-Sep-2018 00:00	06-Sep-2018 00:00	03-Sep-2018 00:00	03-Sep-2018 00:00	30-Aug-2018 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES1826738-001**	**ES1826738-002**	**ES1826738-003**	**ES1826738-004**	**ES1826738-005**
				Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	**6.5**	**5.7**	**6.2**	**5.6**	**5.6**
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	**41**	**106**	**116**	**24**	**60**
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**28.4**	**14.6**	**18.8**	**7.8**	**32.6**
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	**460**	**130**	**60**	**10**	**80**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	10	mg/kg	**30**	**20**	**320**	**20**	**130**

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL)**

			Client sample ID	**BHA302 1.0-1.45M**	**BH201 4.0-4.45M**	**----**	**----**	**----**
			Client sampling date / time	30-Aug-2018 00:00	03-Sep-2018 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1826738-006**	**ES1826738-008**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	**4.5**	**5.8**	----	----	----
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	**84**	**21**	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**18.1**	**18.7**	----	----	----
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	**100**	**20**	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	10	mg/kg	**40**	**20**	----	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order : **ES1826738**
Amendment : **1**

Client : **GHD PTY LTD**
Contact : MR BRIAN OBERDORF
Address : PO BOX 5403
NEWCASTLE WEST NSW, AUSTRALIA 2302
Telephone : ----
Project : 2219573
Order number : 2219573
C-O-C number : ----
Sampler : D.COOPER
Site :
Quote number : EN/005/18
No. of samples received : 7
No. of samples analysed : 7

Page : 1 of 3

Laboratory : Environmental Division Sydney
Contact : Brenda Hong
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : (02) 8784 8504
Date Samples Received : 11-Sep-2018
Date Analysis Commenced : 12-Sep-2018
Issue Date : 26-Sep-2018

ilac-MRA NATA
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 Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ashesh Patel	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA002: pH 1:5 (Soils) (QC Lot: 1926568)									
ES1826782-003	Anonymous	EA002: pH Value	----	0.1	pH Unit	6.3	6.3	0.00	0% - 20%
ES1826738-001	TP103 0.5-0.6M	EA002: pH Value	----	0.1	pH Unit	6.5	6.5	0.00	0% - 20%
EA010: Conductivity (1:5) (QC Lot: 1926570)									
ES1826782-003	Anonymous	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	50	53	6.41	0% - 20%
ES1826738-001	TP103 0.5-0.6M	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	41	40	4.44	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1927153)									
ES1826724-024	Anonymous	EA055: Moisture Content	----	0.1	%	4.7	5.1	8.58	No Limit
ES1826738-008	BH201 4.0-4.45M	EA055: Moisture Content	----	0.1	%	18.7	18.6	0.00	0% - 20%
ED040S: Soluble Major Anions (QC Lot: 1926569)									
ES1826782-003	Anonymous	ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	20	30	0.00	No Limit
ES1826738-001	TP103 0.5-0.6M	ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	460	500	9.28	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 1926571)									
ES1826807-003	Anonymous	ED045G: Chloride	16887-00-6	10	mg/kg	620	620	0.00	0% - 20%
ES1826738-001	TP103 0.5-0.6M	ED045G: Chloride	16887-00-6	10	mg/kg	30	40	0.00	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	*Laboratory Control Spike (LCS) Report*			
					Spike	*Spike Recovery (%)*	*Recovery Limits (%)*	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EA010: Conductivity (1:5) (QCLot: 1926570)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	96.4	92	108
ED040S: Soluble Major Anions (QCLot: 1926569)								
ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	150 mg/kg	98.5	80	120
ED045G: Chloride by Discrete Analyser (QCLot: 1926571)								
ED045G: Chloride	16887-00-6	10	mg/kg	<10	50 mg/kg	110	75	125
				<10	5000 mg/kg	101	79	117

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	*SpikeRecovery(%)*	*Recovery Limits (%)*	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED045G: Chloride by Discrete Analyser (QCLot: 1926571)							
ES1826738-001	TP103 0.5-0.6M	ED045G: Chloride	16887-00-6	1250 mg/kg	118	70	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1826738**	Page	: 1 of 5
Amendment	: **1**		
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR BRIAN OBERDORF	Telephone	: (02) 8784 8504
Project	: 2219573	Date Samples Received	: 11-Sep-2018
Site	:	Issue Date	: 26-Sep-2018
Sampler	: D.COOPER	No. of samples received	: 7
Order number	: 2219573	No. of samples analysed	: 7

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method **Container** / Client Sample ID(s)	*Extraction / Preparation* *Date extracted*	 *Due for extraction*	 **Days overdue**	*Analysis* *Date analysed*	 *Due for analysis*	 **Days overdue**
EA002: pH 1:5 (Soils)						
Snap Lock Bag BH303 2.5-2.95M, BH304 0.5-0.95M, BH201 4.0-4.45M	12-Sep-2018	10-Sep-2018	**2**	----	----	----
Snap Lock Bag BH302 4.0-4.45M, BHA302 1.0-1.45M	12-Sep-2018	06-Sep-2018	**6**	----	----	----
EA010: Conductivity (1:5)						
Snap Lock Bag BH303 2.5-2.95M, BH304 0.5-0.95M, BH201 4.0-4.45M	12-Sep-2018	10-Sep-2018	**2**	----	----	----
Snap Lock Bag BH302 4.0-4.45M, BHA302 1.0-1.45M	12-Sep-2018	06-Sep-2018	**6**	----	----	----

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method *Container / Client Sample ID(s)*	*Sample Date*	*Extraction / Preparation* ***Date extracted***	 *Due for extraction*	 *Evaluation*	*Analysis* ***Date analysed***	 *Due for analysis*	 *Evaluation*
EA002: pH 1:5 (Soils)							
Snap Lock Bag (EA002) BH303 2.5-2.95M, BH304 0.5-0.95M, BH201 4.0-4.45M	**03-Sep-2018**	**12-Sep-2018**	10-Sep-2018	✘	**12-Sep-2018**	12-Sep-2018	✓
Snap Lock Bag (EA002) TP103 0.5-0.6M, TP103 1.0-1.1M	**06-Sep-2018**	**12-Sep-2018**	13-Sep-2018	✓	**12-Sep-2018**	12-Sep-2018	✓
Snap Lock Bag (EA002) BH302 4.0-4.45M, BHA302 1.0-1.45M	**30-Aug-2018**	**12-Sep-2018**	06-Sep-2018	✘	**12-Sep-2018**	12-Sep-2018	✓

Matrix: **SOIL**

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

Method ***Container*** */ Client Sample ID(s)*	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EA010: Conductivity (1:5)							
Snap Lock Bag (EA010) BH303 2.5-2.95M, BH304 0.5-0.95M, BH201 4.0-4.45M	**03-Sep-2018**	**12-Sep-2018**	10-Sep-2018	✘	**12-Sep-2018**	10-Oct-2018	✓
Snap Lock Bag (EA010) TP103 0.5-0.6M, TP103 1.0-1.1M	**06-Sep-2018**	**12-Sep-2018**	13-Sep-2018	✓	**12-Sep-2018**	10-Oct-2018	✓
Snap Lock Bag (EA010) BH302 4.0-4.45M, BHA302 1.0-1.45M	**30-Aug-2018**	**12-Sep-2018**	06-Sep-2018	✘	**12-Sep-2018**	10-Oct-2018	✓
EA055: Moisture Content (Dried @ 105-110°C)							
Snap Lock Bag (EA055) BH303 2.5-2.95M, BH304 0.5-0.95M, BH201 4.0-4.45M	**03-Sep-2018**	**----**	----	----	**12-Sep-2018**	17-Sep-2018	✓
Snap Lock Bag (EA055) TP103 0.5-0.6M, TP103 1.0-1.1M	**06-Sep-2018**	**----**	----	----	**12-Sep-2018**	20-Sep-2018	✓
Snap Lock Bag (EA055) BH302 4.0-4.45M, BHA302 1.0-1.45M	**30-Aug-2018**	**----**	----	----	**12-Sep-2018**	13-Sep-2018	✓
ED040S : Soluble Sulfate by ICPAES							
Snap Lock Bag (ED040S) BH303 2.5-2.95M, BH304 0.5-0.95M, BH201 4.0-4.45M	**03-Sep-2018**	**12-Sep-2018**	01-Oct-2018	✓	**12-Sep-2018**	10-Oct-2018	✓
Snap Lock Bag (ED040S) TP103 0.5-0.6M, TP103 1.0-1.1M	**06-Sep-2018**	**12-Sep-2018**	04-Oct-2018	✓	**12-Sep-2018**	10-Oct-2018	✓
Snap Lock Bag (ED040S) BH302 4.0-4.45M, BHA302 1.0-1.45M	**30-Aug-2018**	**12-Sep-2018**	27-Sep-2018	✓	**12-Sep-2018**	10-Oct-2018	✓
ED045G: Chloride by Discrete Analyser							
Snap Lock Bag (ED045G) BH303 2.5-2.95M, BH304 0.5-0.95M, BH201 4.0-4.45M	**03-Sep-2018**	**12-Sep-2018**	01-Oct-2018	✓	**12-Sep-2018**	10-Oct-2018	✓
Snap Lock Bag (ED045G) TP103 0.5-0.6M, TP103 1.0-1.1M	**06-Sep-2018**	**12-Sep-2018**	04-Oct-2018	✓	**12-Sep-2018**	10-Oct-2018	✓
Snap Lock Bag (ED045G) BH302 4.0-4.45M, BHA302 1.0-1.45M	**30-Aug-2018**	**12-Sep-2018**	27-Sep-2018	✓	**12-Sep-2018**	10-Oct-2018	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Chloride Soluble By Discrete Analyser	ED045G	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chloride Soluble By Discrete Analyser	ED045G	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chloride Soluble By Discrete Analyser	ED045G	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride Soluble By Discrete Analyser	ED045G	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
pH (1:5)	EA002	SOIL	In house: Referenced to Rayment and Lyons 4A1 and APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3)
Electrical Conductivity (1:5)	EA010	SOIL	In house: Referenced to Rayment and Lyons 3A1 and APHA 2510. Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3)
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Major Anions - Soluble	ED040S	SOIL	In house: Soluble Anions are determined off a 1:5 soil / water extract by ICPAES.
Chloride Soluble By Discrete Analyser	ED045G	SOIL	In house: Referenced to APHA 4500-Cl- E. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm. Analysis is performed on a 1:5 soil / water leachate.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095
Ph: 08 8359 0890 E: adelaide@alsglobal.com
☐BRISBANE 32 Shand Street Stafford QLD 4053
Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680
Ph: 07 7471 5600 E: gladstone@alsglobal.com
☐MACKAY 78 Harbour Road Mackay QLD 4740
Ph: 07 4944 0177 E: mackay@alsglobal.com
☐MELBOURNE 2-4 Westall Road Springvale VIC 3171
Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐MUDGEE 27 Sydney Road Mudgee NSW 2850
Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304
Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541
Ph: 024423 2063 E: nowra@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090
Ph: 08 9209 7655 E: samples.perth@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164
Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818
Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: GHD
OFFICE: Newcastle
PROJECT: Belmont Temporary Desalination Plant
ORDER NUMBER: 2219573
PROJECT MANAGER: Brian Oberdorf
CONTACT PH:
SAMPLER: D. Cooper
SAMPLER MOBILE:0402 375 525
COC emailed to ALS? (YES / NO)
EDD FORMAT (or default):
Email Reports to demetrius.cooper@ghd.com
Email Invoice to (will default to PM if no other addresses are listed):

TURNAROUND REQUIREMENTS :
(Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☒ Standard TAT **(List due date):**
☐ Non Standard or urgent TAT **(List due date):**

ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)
COC: 1 2 3 4 5 6 7
OF: 1 2 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No [✓ N/A]
Free ice / frozen ice bricks present upon receipt? [✓ Yes] No N/A
Random Sample Temperature on Receipt: C
Other comment: 13-0

RELINQUISHED BY:
Demetrius Cooper
DATE/TIME:
11/09/18

RECEIVED BY:
DATE/TIME:
11/9/18 8-36am

RELINQUISHED BY:
DATE/TIME:

RECEIVED BY:
DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	Aggressivity Suite (EC, PH, Sulphur, Cl								Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	TP103, 0.5 - 0.6m,	6/09/2018	S	B	1	x								
	TP103, 1.0 - 1.1 m	6/09/2018	S	B	1	x								
	BH303, [redacted] 2.5-2.95m	3/09/2018	S	B	1	x								
	BH304, 0.5 - 0.95m	3/09/2018	S	B	1	x								
	BH302, 4.0 - 4.45 m, [redacted]	30/08/2018	S	B	1	x								
	BHA302, 1.0-1.45 m	30/08/2018	S	B	1	x								
	BH202, 2.5 - 2.95 m	3/09/2018	S	B	1	x								
	BH201, 4.0 - 4.45 m	3/09/2018	s	B	1	x								
					TOTAL 8	8								

Environmental Division
Sydney
Work Order Reference
ES1826738

Telephone : +61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

ALS Environmental

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ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095
Ph: 08 8359 0890 E: adelaide@alsglobal.com
☐BRISBANE 32 Shand Street Stafford QLD 4053
Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680
Ph: 07 7471 5600 E: gladstone@alsglobal.com
☐MACKAY 78 Harbour Road Mackay QLD 4740
Ph: 07 4944 0177 E: mackay@alsglobal.com
☐MELBOURNE 2-4 Westall Road Springvale VIC 3171
Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐MUDGEE 27 Sydney Road Mudgee NSW 2850
Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304
Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541
Ph: 024423 2063 E: nowra@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090
Ph: 08 9209 7655 E: samples.perth@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164
Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818
Ph: 07 4796 0600 E: townsville environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: GHD
OFFICE: Newcastle
PROJECT: Belmont Temporary Desalination Plant
ORDER NUMBER: 2219573
PROJECT MANAGER: Brian Oberdorf
CONTACT PH:
SAMPLER: D. Cooper
SAMPLER MOBILE:0402 375 525
COC emailed to ALS? (YES / NO)
EDD FORMAT (or default):
Email Reports to demetrius.cooper@ghd.com
Email Invoice to (will default to PM if no other addresses are listed):

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☒ Standard TAT (**List due date):**
☐ Non Standard or urgent TAT (**List due date):**

ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)
COC: 1 2 3 4 5 6 7
OF: 1 2 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No [✓ N/A]
Free ice / frozen ice bricks present upon receipt? [✓ Yes] No N/A
Random Sample Temperature on Receipt: °C
Other comment: 13·0

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Demetrius Cooper			MC
DATE/TIME: 11/09/18	DATE/TIME: 11/9/18 8-36am	DATE/TIME:	DATE/TIME: 11/9/18

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE LAB ID	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W) SAMPLE ID	DATE / TIME	MATRIX	CONTAINER INFORMATION TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required). Aggressivity Suite (EC, PH, Sulphur, Cl	Additional Information Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	TP103, 0.5 - 0.6m,	6/09/2018	S	B	1	x	
2	TP103, 1.0 - 1.1 m	6/09/2018	S	B	1	x	
3	BH303, [redacted] 2.5-2.95m	3/09/2018	S	B	1	x	
4	BH304, 0.5 - 0.95m	3/09/2018	S	B	1	x	
5	BH302, 4.0 - 4.45 m, [redacted]	30/08/2018	S	B	1	x	
6	BHA302, 1.0-1.45 m	30/08/2018	S	B	1	x	
7	BH202, 2.5 - 2.95 m -SNR P.T 11/9/18	3/09/2018	S	B	1	x	
8	BH201, 4.0 - 4.45 m	3/09/2018	S	B	1	x	
				TOTAL	8	8	

E-MAILED

LAB OF ORIGIN:
NEWCASTLE

Environmental Division
Sydney
Work Order Reference
ES1826738

Telephone : +61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

1

eurofins mgt

☐ **Sydney**
Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
Phone: +612 9900 8400
Email: enviro.syd@mgtlabmark.com.au

☐ **Brisbane**
Unit 1-21 Smallwood Place, Murrarie
Phone: +617 3902 4600
Email: enviro.bris@mgtlabmark.com.au

☐ **Melbourne**
2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 8564 5000 Fax: +613 8564 5090
Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Page ____ of ____

Company Name : GHD
Office Address : 24 Honeysuckle Drive
Newcastle 2300

Contact Name: Joanna Sylvester
Project Manager : Joanna Sylvester
Email for results : Andrew Braillin / Joanna Sylvester

Purchase Order : 12520831
PROJECT Number : 12520831
PROJECT Name :

COC Number :
Eurofins | mgt quote ID : 141113GHDN
Data output format:

Special Directions & Comments :
Please analyse the following as composite sample for Suite B13:

COMP 1 - TP205_0.0-0.1 , TP204_0.0-0.1 and TP203_0.0-0.1

COMP 2 - TP206_0.0-0.1, TP207_0.0-0.1 and TP208_0.0-0.1

COMP 3 - HA201_0.2-0.3, TP202_0.2-0.3 and TP206_0.2-0.3

COMP 4 - TP204_0.5-0.6, TP205_0.5-0.6 and TP203_0.5-0.6

Analytes

	Sample ID	Date	Matrix	Suite B1 (TRH/BTEXN)	Heavy metals (As, Cd, Cr,Cu, Ni, Pb, Zn, Hg	Asbestos	PAHs	Suite B13 (OCPs / PCBS) - Comp
1	HA201_0.0-0.1	10/06/2020	S	X	X	X	X	
2	FD03	10/06/2020	S					
3	HA201_0.2-0.3	10/06/2020	S	X	X		X	
4	TP202_0.0-0.1	10/06/2020	S	X	X	X	X	
5	TP202_0.2_0.3	10/06/2020	S	X	X		X	
6	TP202_0.5-0.6	10/06/2020	S					
7	TP202_1.0-1.1	10/06/2020	S					
8	TP203_0.0-0.1	10/06/2020	S	X	X	X	X	
9	TP203_0.2-0.3	10/06/2020	S	X	X		X	
10	FD02	10/06/2020	S					
11	TP203_0.5-0.6	10/06/2020	S					
12	TP203_1.0-1.1	10/06/2020	S					
13	TP204_0.0-0.1	10/06/2020	S	X	X	X	X	
14	TP204_0.2-0.3	10/06/2020	S	X	X		X	
15	TP204_0.5-0.6	10/06/2020	S					
16	TP204_1.0-1.1	10/06/2020	S					
17	TP204_1.5-1-6	10/06/2020	S					
18	TP205_0.0-0.1	10/06/2020	S	X	X	X	X	
19	TP205_1.0-1.1	10/06/2020	S					

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

1000P	500P	250P	60P	1000A	500A	125A	40Vial

Sample comments:

Relinquished By: Andrew Braillin
Date & Time:: 43997
Signature:

Laboratory Staff
Received By: Elvis D
Date & Time:: 15/6/20 11:49AM
Signature:

Turn around time
1 DAY ☐ 2 DAY ☐ 3 DAY ☐
5 DAY ☑ 10 DAY ☐ Other:

Method Of Shipment
☐ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival: 20.2°C
Report number: 725536

eurofins mgt

☐ **Sydney**
Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
Phone: +612 9900 8400
Email: enviro.syd@mgtlabmark.com.au

☐ **Brisbane**
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Phone: +617 3902 4600
Email: enviro.bris@mgtlabmark.com.au

☐ **Melbourne**
2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 8564 5000 Fax: +613 8564 5090
Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Page ____ of ____

Company Name :	GHD	**Contact Name:**	Joanna Sylvester	**Purchase Order :**	12520831	**COC Number :**	
Office Address :	24 Honeysuckle Drive	**Project Manager :**	Joanna Sylvester	**PROJECT Number :**	12520831	**Eurofins | mgt quote ID :**	141113GHDN
	Newcastle 2300	**Email for results :**	Andrew Braith / Joanna Sylvester	**PROJECT Name :**		**Data output format:**	

Special Directions & Comments :

Eurofins | mgt DI water batch number:

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Analytes / **Containers:**

	Sample ID	Date	Matrix	Suite B1 (TRH/BTEXN)	Heavy metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)	Asbestos	PAHs	Suite 13B (OCPS/PCBs)	Hold	PFAS	1000P	500P	250P	60P	1000A	500A	125A	40Vial	Sample comments:
1	TP205_0.5-0.6	10/06/2020	S	X	X	X	X												
2	FD01	10/06/2020	S	X	X		X												
3	TP205_1.5-1.6	10/06/2020	S																
4	TP206_0.0-0.1	10/06/2020	S	X	X	X	X												
5	TP206_0.2-0.3	10/06/2020	S																
6	TP206_0.5-0.6	10/06/2020	S	X	X		X												
7	TP206_1.0-1.1	10/06/2020	S																
8	TP206_1.5-1.6	10/06/2020	S																
9	TP207_0.0-0.1	10/06/2020	S	X	X	X	X												
10	TP207_0.2-0.3	10/06/2020	S	X	X		X			X									PFAS sample
11	FD04	10/06/2020	S																PFAS sample
12	TP208_0.0-0.1	10/06/2020	S	X	X	X	X												
13	FD05	10/06/2020	S	X	X		X												
14	TP208_0.2-0.3	10/06/2020	S	X	X		X												PFAS sample
15	TP208_0.5-0.6	10/06/2020	S																
16	TP208_1.0-1.1	10/06/2020	S																
17																			
18																			
19																			

Relinquished By:

Date & Time::

Signature:

Laboratory Staff

Received By: Elvis D

Date & Time: 15/6/20 11:49AM

Signature:

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐
5 DAY ☐ 10 DAY ☐ Other:

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival: 20.2°c

Report number: 725536

Sample Receipt Advice

Company name:	**GHD Pty Ltd NEWCASTLE**
Contact name:	Andrew Brajlih
Project ID:	12520831
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Jun 15, 2020 11:49 AM
Eurofins reference:	**725536**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins Sample Receipt : 20.2 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Andrew Black on Phone : (+61) 2 9900 8490 or by e.mail: AndrewBlack@eurofins.com

Results will be delivered electronically via e.mail to Andrew Brajlih - Andrew.Brajlih@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd NEWCASTLE email address.

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Project Name:
Project ID: 12520831

Order No.: 12520831
Report #: 725536
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Jun 15, 2020 11:49 AM
Due: Jun 22, 2020
Priority: 5 Day
Contact Name: Andrew Brajlih

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Suite B13: OCP/PCB	Moisture Set	Eurofins | mgt Suite B1	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794													X
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	HA201_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23439	X		X	X		X	X	
2	HA201_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23440			X	X		X	X	
3	TP202_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23441	X		X	X		X	X	
4	TP202_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23442			X	X		X	X	
5	TP203_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23443	X		X	X		X	X	
6	TP203_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23444			X	X		X	X	
7	TP204_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23445	X		X	X		X	X	
8	TP204_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23446			X	X		X	X	
9	TP205_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23447	X		X	X		X	X	
10	TP205_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23448	X		X	X		X	X	

Company Name: GHD Pty Ltd NEWCASTLE
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Received: Jun 15, 2020 11:49 AM
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Contact Name: Andrew Brajlih

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Suite B13: OCP/PCB	Moisture Set	Eurofins | mgt Suite B1	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794													X
Perth Laboratory - NATA Site # 23736													
11	FD01	Jun 10, 2020		Soil	S20-Jn23449			X	X		X	X	
12	TP206_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23450	X		X	X		X	X	
13	TP206_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23451			X	X		X	X	
14	TP207_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23452	X		X	X		X	X	
15	TP207_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23453			X	X		X	X	X
16	TP208_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23454	X		X	X		X	X	
17	FD05	Jun 10, 2020		Soil	S20-Jn23455			X	X		X	X	
18	TP208_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23456			X	X		X	X	
19	COMP 1	Jun 10, 2020		Soil	S20-Jn23457					X	X		
20	COMP 2	Jun 10, 2020		Soil	S20-Jn23458					X	X		
21	COMP 3	Jun 10, 2020		Soil	S20-Jn23459					X	X		
22	COMP 4	Jun 10, 2020		Soil	S20-Jn23460					X	X		
23	FD03	Jun 10, 2020		Soil	S20-Jn23461		X						

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Project Name:
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Order No.: 12520831
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Received: Jun 15, 2020 11:49 AM
Due: Jun 22, 2020
Priority: 5 Day
Contact Name: Andrew Brajlih

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Suite B13: OCP/PCB	Moisture Set	Eurofins | mgt Suite B1	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794													X
Perth Laboratory - NATA Site # 23736													
24	TP202_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23462		X						
25	TP202_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23463		X						
26	FD02	Jun 10, 2020		Soil	S20-Jn23464		X						
27	TP203_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23465		X						
28	TP203_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23466		X						
29	TP204_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23467		X						
30	TP204_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23468		X						
31	TP204_1.5-1.6	Jun 10, 2020		Soil	S20-Jn23469		X						
32	TP205_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23470		X						
33	TP205_1.5-1.6	Jun 10, 2020		Soil	S20-Jn23471		X						
34	TP206_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23472		X						
35	TP206_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23473		X						
36	TP206_1.5-1.6	Jun 10, 2020		Soil	S20-Jn23474		X						

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Order No.: 12520831
Report #: 725536
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Jun 15, 2020 11:49 AM
Due: Jun 22, 2020
Priority: 5 Day
Contact Name: Andrew Brajlih

Project Name:
Project ID: 12520831

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Suite B13: OCP/PCB	Moisture Set	Eurofins | mgt Suite B1	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794													X
Perth Laboratory - NATA Site # 23736													
37	FD04	Jun 10, 2020		Soil	S20-Jn23475		X						
38	TP208_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23476		X						
39	TP208_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23477		X						
Test Counts						9	17	18	18	4	22	18	1

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

GHD Pty Ltd
3/24 Honeysuckle Dve
Newcastle
NSW 2300

Attention:	Andrew Brajlih
Report	725536-AID
Project Name	
Project ID	12520831
Received Date	Jun 15, 2020
Date Reported	Jun 22, 2020

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name
Project ID 12520831
Date Sampled Jun 10, 2020
Report 725536-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
HA201_0.0-0.1	20-Jn23439	Jun 10, 2020	Approximate Sample 49g Sample consisted of: Grey fine grain sand and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP202_0.0-0.1	20-Jn23441	Jun 10, 2020	Approximate Sample 50g Sample consisted of: Brown fine-grained soil, grey fine grain sand, rocks and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP203_0.0-0.1	20-Jn23443	Jun 10, 2020	Approximate Sample 48g Sample consisted of: Brown coarse-grained soil, grey fine grain sand, rocks and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP204_0.0-0.1	20-Jn23445	Jun 10, 2020	Approximate Sample 43g Sample consisted of: Brown coarse-grained soil, grey fine grain sand, rocks and organic debris	Chrysotile asbestos detected in the form of loose fibre bundles. Approximate dimensions of fibre bundle = 0.5x<0.5x<0.5mm. Organic fibre detected. No trace asbestos detected.
TP205_0.0-0.1	20-Jn23447	Jun 10, 2020	Approximate Sample 54g Sample consisted of: Brown coarse-grained soil and rocks and cement fragments	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP205_0.5-0.6	20-Jn23448	Jun 10, 2020	Approximate Sample 68g Sample consisted of: Brown coarse-grained soil and rocks, cement fragments and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP206_0.0-0.1	20-Jn23450	Jun 10, 2020	Approximate Sample 53g Sample consisted of: Grey fine-grained sand, rocks and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP207_0.0-0.1	20-Jn23452	Jun 10, 2020	Approximate Sample 71g Sample consisted of: Grey fine-grained sand, rocks and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP208_0.0-0.1	20-Jn23454	Jun 10, 2020	Approximate Sample 100g Sample consisted of: Yellow fine-grained sand and organic dbris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	**Testing Site**	**Extracted**	**Holding Time**
Asbestos - LTM-ASB-8020	Sydney	Jun 15, 2020	Indefinite

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Project Name:
Project ID: 12520831

Order No.: 12520831
Report #: 725536
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Jun 15, 2020 11:49 AM
Due: Jun 22, 2020
Priority: 5 Day
Contact Name: Andrew Brajlih

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Suite B13: OCP/PCB	Moisture Set	Eurofins | mgt Suite B1	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794													X
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	HA201_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23439	X		X	X		X	X	
2	HA201_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23440			X	X		X	X	
3	TP202_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23441	X		X	X		X	X	
4	TP202_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23442			X	X		X	X	
5	TP203_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23443	X		X	X		X	X	
6	TP203_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23444			X	X		X	X	
7	TP204_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23445	X		X	X		X	X	
8	TP204_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23446			X	X		X	X	
9	TP205_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23447	X		X	X		X	X	
10	TP205_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23448	X		X	X		X	X	

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Order No.: 12520831
Report #: 725536
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Jun 15, 2020 11:49 AM
Due: Jun 22, 2020
Priority: 5 Day
Contact Name: Andrew Brajlih

Project Name:
Project ID: 12520831

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Suite B13: OCP/PCB	Moisture Set	Eurofins | mgt Suite B1	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794													X
Perth Laboratory - NATA Site # 23736													
11	FD01	Jun 10, 2020		Soil	S20-Jn23449			X	X		X	X	
12	TP206_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23450	X		X	X		X	X	
13	TP206_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23451			X	X		X	X	
14	TP207_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23452	X		X	X		X	X	
15	TP207_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23453			X	X		X	X	X
16	TP208_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23454	X		X	X		X	X	
17	FD05	Jun 10, 2020		Soil	S20-Jn23455			X	X		X	X	
18	TP208_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23456			X	X		X	X	
19	COMP 1	Jun 10, 2020		Soil	S20-Jn23457					X	X		
20	COMP 2	Jun 10, 2020		Soil	S20-Jn23458					X	X		
21	COMP 3	Jun 10, 2020		Soil	S20-Jn23459					X	X		
22	COMP 4	Jun 10, 2020		Soil	S20-Jn23460					X	X		
23	FD03	Jun 10, 2020		Soil	S20-Jn23461		X						

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Sample Detail						Asbestos - AS4964	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Suite B13: OCP/PCB	Moisture Set	Eurofins | mgt Suite B1	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794													X
Perth Laboratory - NATA Site # 23736													
24	TP202_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23462		X						
25	TP202_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23463		X						
26	FD02	Jun 10, 2020		Soil	S20-Jn23464		X						
27	TP203_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23465		X						
28	TP203_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23466		X						
29	TP204_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23467		X						
30	TP204_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23468		X						
31	TP204_1.5-1.6	Jun 10, 2020		Soil	S20-Jn23469		X						
32	TP205_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23470		X						
33	TP205_1.5-1.6	Jun 10, 2020		Soil	S20-Jn23471		X						
34	TP206_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23472		X						
35	TP206_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23473		X						
36	TP206_1.5-1.6	Jun 10, 2020		Soil	S20-Jn23474		X						

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NSW 2300

Project Name:
Project ID: 12520831

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Report #: 725536
Phone: 02 4979 9999
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Received: Jun 15, 2020 11:49 AM
Due: Jun 22, 2020
Priority: 5 Day
Contact Name: Andrew Brajlih

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Suite B13: OCP/PCB	Moisture Set	Eurofins | mgt Suite B1	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794													X
Perth Laboratory - NATA Site # 23736													
37	FD04	Jun 10, 2020		Soil	S20-Jn23475		X						
38	TP208_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23476		X						
39	TP208_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23477		X						
Test Counts						9	17	18	18	4	22	18	1

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

The samples received were not collected in an approved asbestos bag and was therefore sub-sampled from the 250mL glass jar. Valid sub-sampling procedures were applied so as to ensure that the sub-samples to be analysed accurately represented the samples received.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Sayeed Abu	Senior Analyst-Asbestos (NSW)

Authorised by:

Chamath JHM Annakkage	Senior Analyst-Asbestos (NSW)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

GHD Pty Ltd
3/24 Honeysuckle Dve
Newcastle
NSW 2300

Attention: **Andrew Brajlih**

Report **725536-S-V2**
Project name
Project ID 12520831
Received Date Jun 15, 2020

Client Sample ID			**HA201_0.0-0.1**	**HA201_0.2-0.3**	**TP202_0.0-0.1**	**TP202_0.2-0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Jn23439**	**S20-Jn23440**	**S20-Jn23441**	**S20-Jn23442**
Date Sampled			**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	33	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	480	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	780	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	1293	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	0.2	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	90	87	99	73
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	1100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	650	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	1750	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			**HA201_0.0-0.1**	**HA201_0.2-0.3**	**TP202_0.0-0.1**	**TP202_0.2-0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Jn23439**	**S20-Jn23440**	**S20-Jn23441**	**S20-Jn23442**
Date Sampled			**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	97	85	98	123
p-Terphenyl-d14 (surr.)	1	%	107	99	108	135
Heavy Metals						
Arsenic	2	mg/kg	2.5	2.8	4.0	2.1
Cadmium	0.4	mg/kg	< 0.4	< 0.4	5.4	< 0.4
Chromium	5	mg/kg	< 5	< 5	27	< 5
Copper	5	mg/kg	< 5	< 5	450	8.6
Lead	5	mg/kg	5.8	< 5	130	< 5
Mercury	0.1	mg/kg	< 0.1	< 0.1	2.0	< 0.1
Nickel	5	mg/kg	< 5	< 5	15	< 5
Zinc	5	mg/kg	17	< 5	730	8.2
% Moisture	1	%	9.4	< 1	18	1.8

Client Sample ID			**TP203_0.0-0.1**	**TP203_0.2-0.3**	**TP204_0.0-0.1**	**TP204_0.2-0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Jn23443**	**S20-Jn23444**	**S20-Jn23445**	**S20-Jn23446**
Date Sampled			**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	22	< 20	42	< 20
TRH C15-C28	50	mg/kg	460	< 50	470	< 50
TRH C29-C36	50	mg/kg	510	< 50	730	< 50
TRH C10-C36 (Total)	50	mg/kg	992	< 50	1242	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	90	51	55	101
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	51	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	51	< 50
TRH >C16-C34	100	mg/kg	880	< 100	1000	< 100

Client Sample ID			TP203_0.0-0.1	TP203_0.2-0.3	TP204_0.0-0.1	TP204_0.2-0.3
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Jn23443**	**S20-Jn23444**	**S20-Jn23445**	**S20-Jn23446**
Date Sampled			Jun 10, 2020	Jun 10, 2020	Jun 10, 2020	Jun 10, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C34-C40	100	mg/kg	380	< 100	620	< 100
TRH >C10-C40 (total)*	100	mg/kg	1260	< 100	1671	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	96	105	79	110
p-Terphenyl-d14 (surr.)	1	%	121	121	88	124
Heavy Metals						
Arsenic	2	mg/kg	3.3	< 2	3.0	< 2
Cadmium	0.4	mg/kg	1.5	< 0.4	3.1	< 0.4
Chromium	5	mg/kg	11	< 5	23	< 5
Copper	5	mg/kg	230	< 5	370	< 5
Lead	5	mg/kg	60	< 5	130	< 5
Mercury	0.1	mg/kg	1.1	< 0.1	2.3	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	150	13	260	47
% Moisture	1	%	14	1.4	22	8.8

Client Sample ID			TP205_0.0-0.1	TP205_0.5-0.6	FD01	TP206_0.0-0.1
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Jn23447**	**S20-Jn23448**	**S20-Jn23449**	**S20-Jn23450**
Date Sampled			Jun 10, 2020	Jun 10, 2020	Jun 10, 2020	Jun 10, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	57	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	57	< 50	< 50

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	TP205_0.0-0.1 Soil S20-Jn23447 Jun 10, 2020	TP205_0.5-0.6 Soil S20-Jn23448 Jun 10, 2020	FD01 Soil S20-Jn23449 Jun 10, 2020	TP206_0.0-0.1 Soil S20-Jn23450 Jun 10, 2020
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	90	67	105	97
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	96	94	94	97
p-Terphenyl-d14 (surr.)	1	%	97	98	99	102
Heavy Metals						
Arsenic	2	mg/kg	5.2	6.8	2.8	2.7
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	12	< 5	< 5
Copper	5	mg/kg	10	6.9	< 5	< 5
Lead	5	mg/kg	19	14	43	< 5
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	170	100	56	7.4
% Moisture	1	%	5.9	9.8	10	9.0

Client Sample ID			TP206_0.5-0.6	TP207_0.0-0.1	TP207_0.2-0.3	TP208_0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Jn23451	S20-Jn23452	S20-Jn23453	S20-Jn23454
Date Sampled			Jun 10, 2020	Jun 10, 2020	Jun 10, 2020	Jun 10, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	83	69	72	90
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	98	101	98	92
p-Terphenyl-d14 (surr.)	1	%	102	103	100	98

Client Sample ID **Sample Matrix** **Eurofins Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**TP206_0.5-0.6** **Soil** **S20-Jn23451** **Jun 10, 2020**	**TP207_0.0-0.1** **Soil** **S20-Jn23452** **Jun 10, 2020**	**TP207_0.2-0.3** **Soil** **S20-Jn23453** **Jun 10, 2020**	**TP208_0.0-0.1** **Soil** **S20-Jn23454** **Jun 10, 2020**
Heavy Metals						
Arsenic	2	mg/kg	3.3	< 2	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	< 5	< 5	< 5
Copper	5	mg/kg	< 5	< 5	< 5	< 5
Lead	5	mg/kg	< 5	< 5	< 5	< 5
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	8.4	15	< 5	< 5
% Moisture	1	%	11	1.3	11	2.5
PFASs Summations						
Sum (PFHxS + PFOS)*	0.1	ug/kg	-	-	< 1	-
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.1	ug/kg	-	-	< 1	-
Sum of PFASs (n=30)*	0.5	ug/kg	-	-	< 1	-
Sum of US EPA PFAS (PFOS + PFOA)*	0.1	ug/kg	-	-	< 1	-
Sum of WA DWER PFAS (n=10)*	0.5	ug/kg	-	-	< 1	-
Perfluoroalkyl sulfonamido substances- Trace						
Perfluorooctane sulfonamide (FOSA)[N11]	0.5	ug/kg	-	-	< 1	-
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.5	ug/kg	-	-	< 1	-
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.5	ug/kg	-	-	< 1	-
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	0.5	ug/kg	-	-	< 1	-
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	0.5	ug/kg	-	-	< 1	-
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.5	ug/kg	-	-	< 1	-
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.5	ug/kg	-	-	< 1	-
13C8-FOSA (surr.)	1	%	-	-	71	-
D3-N-MeFOSA (surr.)	1	%	-	-	122	-
D5-N-EtFOSA (surr.)	1	%	-	-	148	-
D7-N-MeFOSE (surr.)	1	%	-	-	100	-
D9-N-EtFOSE (surr.)	1	%	-	-	93	-
D5-N-EtFOSAA (surr.)	1	%	-	-	95	-
D3-N-MeFOSAA (surr.)	1	%	-	-	95	-
Perfluoroalkyl carboxylic acids (PFCAs) - Trace						
Perfluorobutanoic acid (PFBA)[N11]	0.5	ug/kg	-	-	< 1	-
Perfluoropentanoic acid (PFPeA)[N11]	0.1	ug/kg	-	-	< 1	-
Perfluorohexanoic acid (PFHxA)[N11]	0.1	ug/kg	-	-	< 1	-
Perfluoroheptanoic acid (PFHpA)[N11]	0.1	ug/kg	-	-	< 1	-
Perfluorooctanoic acid (PFOA)[N11]	0.1	ug/kg	-	-	< 1	-
Perfluorononanoic acid (PFNA)[N11]	0.1	ug/kg	-	-	< 1	-
Perfluorodecanoic acid (PFDA)[N11]	0.1	ug/kg	-	-	< 1	-
Perfluorotridecanoic acid (PFTrDA)[N15]	0.1	ug/kg	-	-	< 1	-
Perfluoroundecanoic acid (PFUnDA)[N11]	0.1	ug/kg	-	-	< 1	-
Perfluorododecanoic acid (PFDoDA)[N11]	0.1	ug/kg	-	-	< 1	-
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.1	ug/kg	-	-	< 1	-
13C4-PFBA (surr.)	1	%	-	-	92	-
13C5-PFPeA (surr.)	1	%	-	-	103	-
13C5-PFHxA (surr.)	1	%	-	-	111	-

Client Sample ID			**TP206_0.5-0.6**	**TP207_0.0-0.1**	**TP207_0.2-0.3**	**TP208_0.0-0.1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Jn23451**	**S20-Jn23452**	**S20-Jn23453**	**S20-Jn23454**
Date Sampled			**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs) - Trace						
13C4-PFHpA (surr.)	1	%	-	-	96	-
13C8-PFOA (surr.)	1	%	-	-	99	-
13C5-PFNA (surr.)	1	%	-	-	103	-
13C6-PFDA (surr.)	1	%	-	-	120	-
13C2-PFUnDA (surr.)	1	%	-	-	130	-
13C2-PFDoDA (surr.)	1	%	-	-	77	-
13C2-PFTeDA (surr.)	1	%	-	-	90	-
Perfluoroalkyl sulfonic acids (PFSAs)- Trace						
Perfluorobutanesulfonic acid (PFBS)^{N11}	0.1	ug/kg	-	-	< 1	-
Perfluorononanesulfonic acid (PFNS)^{N15}	0.1	ug/kg	-	-	< 1	-
Perfluoropropanesulfonic acid (PFPrS)^{N15}	0.1	ug/kg	-	-	< 1	-
Perfluoropentanesulfonic acid (PFPeS)^{N15}	0.1	ug/kg	-	-	< 1	-
Perfluorohexanesulfonic acid (PFHxS)^{N11}	0.1	ug/kg	-	-	< 1	-
Perfluoroheptanesulfonic acid (PFHpS)^{N15}	0.1	ug/kg	-	-	< 1	-
Perfluorooctanesulfonic acid (PFOS)^{N11}	0.1	ug/kg	-	-	< 1	-
Perfluorodecanesulfonic acid (PFDS)^{N15}	0.1	ug/kg	-	-	< 1	-
13C3-PFBS (surr.)	1	%	-	-	99	-
18O2-PFHxS (surr.)	1	%	-	-	99	-
13C8-PFOS (surr.)	1	%	-	-	98	-
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Trace						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)^{N11}	0.1	ug/kg	-	-	< 1	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)^{N11}	0.5	ug/kg	-	-	< 1	-
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)^{N11}	0.1	ug/kg	-	-	< 1	-
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)^{N11}	0.1	ug/kg	-	-	< 1	-
13C2-4:2 FTSA (surr.)	1	%	-	-	82	-
13C2-6:2 FTSA (surr.)	1	%	-	-	85	-
13C2-8:2 FTSA (surr.)	1	%	-	-	104	-
13C2-10:2 FTSA (surr.)	1	%	-	-	84	-

Client Sample ID			**FD05**	**TP208_0.2-0.3**	**COMP 1**	**COMP 2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Jn23455**	**S20-Jn23456**	**S20-Jn23457**	**S20-Jn23458**
Date Sampled			**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	-	-
TRH C10-C14	20	mg/kg	< 20	< 20	-	-
TRH C15-C28	50	mg/kg	< 50	< 50	-	-
TRH C29-C36	50	mg/kg	< 50	< 50	-	-
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	-	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	-	-
Toluene	0.1	mg/kg	< 0.1	< 0.1	-	-
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	-	-
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	-	-

Client Sample ID **Sample Matrix** **Eurofins Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**FD05** **Soil** **S20-Jn23455** **Jun 10, 2020**	**TP208_0.2-0.3** **Soil** **S20-Jn23456** **Jun 10, 2020**	**COMP 1** **Soil** **S20-Jn23457** **Jun 10, 2020**	**COMP 2** **Soil** **S20-Jn23458** **Jun 10, 2020**
BTEX						
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	-	-
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	-	-
4-Bromofluorobenzene (surr.)	1	%	109	77	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	-	-
TRH C6-C10	20	mg/kg	< 20	< 20	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	-	-
TRH >C10-C16	50	mg/kg	< 50	< 50	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	-	-
TRH >C16-C34	100	mg/kg	< 100	< 100	-	-
TRH >C34-C40	100	mg/kg	< 100	< 100	-	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	-	-
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	-	-
Anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Chrysene	0.5	mg/kg	< 0.5	< 0.5	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Fluorene	0.5	mg/kg	< 0.5	< 0.5	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	-	-
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	-	-
2-Fluorobiphenyl (surr.)	1	%	96	93	-	-
p-Terphenyl-d14 (surr.)	1	%	101	97	-	-
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	-	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	-	-
Chromium	5	mg/kg	< 5	< 5	-	-
Copper	5	mg/kg	< 5	< 5	-	-
Lead	5	mg/kg	< 5	< 5	-	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	-	-
Nickel	5	mg/kg	< 5	< 5	-	-
Zinc	5	mg/kg	6.0	7.3	-	-
% Moisture	1	%	7.2	11	19	6.2

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	FD05 Soil S20-Jn23455 Jun 10, 2020	TP208_0.2-0.3 Soil S20-Jn23456 Jun 10, 2020	COMP 1 Soil S20-Jn23457 Jun 10, 2020	COMP 2 Soil S20-Jn23458 Jun 10, 2020
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	0.2	< 0.1
4.4'-DDD	0.05	mg/kg	-	-	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	-	-	< 0.05	< 0.05
a-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
Aldrin	0.05	mg/kg	-	-	< 0.05	< 0.05
b-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
d-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	-	-	0.12	< 0.05
Endosulfan I	0.05	mg/kg	-	-	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	-	-	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	-	-	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	-	-	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	-	-	< 0.2	< 0.2
Toxaphene	0.1	mg/kg	-	-	< 0.1	< 0.1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	0.12	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	0.32	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	0.2	< 0.2
Dibutylchlorendate (surr.)	1	%	-	-	118	59
Tetrachloro-m-xylene (surr.)	1	%	-	-	135	82
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	-	-	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	-	-	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	-	-	118	59
Tetrachloro-m-xylene (surr.)	1	%	-	-	135	82

Client Sample ID **Sample Matrix** **Eurofins Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**COMP 3** **Soil** **S20-Jn23459** **Jun 10, 2020**	**COMP 4** **Soil** **S20-Jn23460** **Jun 10, 2020**
% Moisture	1	%	6.4	6.6
Organochlorine Pesticides				
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2
Toxaphene	0.1	mg/kg	< 0.1	< 0.1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2
Dibutylchlorendate (surr.)	1	%	74	55
Tetrachloro-m-xylene (surr.)	1	%	93	78
Polychlorinated Biphenyls				
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	74	55
Tetrachloro-m-xylene (surr.)	1	%	93	78

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jun 19, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Jun 19, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jun 19, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jun 19, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Jun 19, 2020	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Jun 19, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Jun 15, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs) - Trace			
Perfluoroalkyl sulfonamido substances- Trace	Brisbane	Oct 22, 2020	14 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - low level			
Perfluoroalkyl carboxylic acids (PFCAs) - Trace	Brisbane	Oct 22, 2020	180 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - low level			
Perfluoroalkyl sulfonic acids (PFSAs)- Trace	Brisbane	Oct 22, 2020	180 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - low level			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Trace	Brisbane	Oct 22, 2020	180 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - low level			
Organochlorine Pesticides	Sydney	Jun 19, 2020	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Sydney	Jun 19, 2020	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Order No.: 12520831
Report #: 725536
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Jun 15, 2020 11:49 AM
Due: Jun 22, 2020
Priority: 5 Day
Contact Name: Andrew Brajlih

Project Name:
Project ID: 12520831

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Suite B13: OCP/PCB	Moisture Set	Eurofins | mgt Suite B1	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794													X
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	HA201_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23439	X		X	X		X	X	
2	HA201_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23440			X	X		X	X	
3	TP202_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23441	X		X	X		X	X	
4	TP202_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23442			X	X		X	X	
5	TP203_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23443	X		X	X		X	X	
6	TP203_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23444			X	X		X	X	
7	TP204_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23445	X		X	X		X	X	
8	TP204_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23446			X	X		X	X	
9	TP205_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23447	X		X	X		X	X	
10	TP205_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23448	X		X	X		X	X	

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Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794													X
Perth Laboratory - NATA Site # 23736													
11	FD01	Jun 10, 2020		Soil	S20-Jn23449			X	X		X	X	
12	TP206_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23450	X		X	X		X	X	
13	TP206_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23451			X	X		X	X	
14	TP207_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23452	X		X	X		X	X	
15	TP207_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23453			X	X		X	X	X
16	TP208_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23454	X		X	X		X	X	
17	FD05	Jun 10, 2020		Soil	S20-Jn23455			X	X		X	X	
18	TP208_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23456			X	X		X	X	
19	COMP 1	Jun 10, 2020		Soil	S20-Jn23457					X	X		
20	COMP 2	Jun 10, 2020		Soil	S20-Jn23458					X	X		
21	COMP 3	Jun 10, 2020		Soil	S20-Jn23459					X	X		
22	COMP 4	Jun 10, 2020		Soil	S20-Jn23460					X	X		
23	FD03	Jun 10, 2020		Soil	S20-Jn23461		X						

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Sample Detail						Asbestos - AS4964	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Suite B13: OCP/PCB	Moisture Set	Eurofins | mgt Suite B1	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794													X
Perth Laboratory - NATA Site # 23736													
24	TP202_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23462		X						
25	TP202_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23463		X						
26	FD02	Jun 10, 2020		Soil	S20-Jn23464		X						
27	TP203_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23465		X						
28	TP203_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23466		X						
29	TP204_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23467		X						
30	TP204_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23468		X						
31	TP204_1.5-1.6	Jun 10, 2020		Soil	S20-Jn23469		X						
32	TP205_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23470		X						
33	TP205_1.5-1.6	Jun 10, 2020		Soil	S20-Jn23471		X						
34	TP206_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23472		X						
35	TP206_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23473		X						
36	TP206_1.5-1.6	Jun 10, 2020		Soil	S20-Jn23474		X						

Company Name:	GHD Pty Ltd NEWCASTLE	**Order No.:**	12520831	**Received:**	Jun 15, 2020 11:49 AM
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		Phone:	02 4979 9999	**Priority:**	5 Day
		Fax:	02 4979 9988	**Contact Name:**	Andrew Brajlih
Project Name:					
Project ID:	12520831				

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Suite B13: OCP/PCB	Moisture Set	Eurofins | mgt Suite B1	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794													X
Perth Laboratory - NATA Site # 23736													
37	FD04	Jun 10, 2020		Soil	S20-Jn23475		X						
38	TP208_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23476		X						
39	TP208_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23477		X						
Test Counts						9	17	18	18	4	22	18	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ug/L:** micrograms per litre
ppm: Parts per million	**ppb:** Parts per billion	**%:** Percentage
org/100mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances- Trace							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 0.5			0.5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 0.5			0.5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/kg	< 0.5			0.5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/kg	< 0.5			0.5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 0.5			0.5	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 0.5			0.5	Pass	
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs) - Trace							
Perfluorobutanoic acid (PFBA)	ug/kg	< 0.5			0.5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 0.1			0.1	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 0.1			0.1	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 0.1			0.1	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 0.1			0.1	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 0.1			0.1	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 0.1			0.1	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 0.1			0.1	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 0.1			0.1	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 0.1			0.1	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 0.1			0.1	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)- Trace							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 0.1			0.1	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 0.1			0.1	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 0.1			0.1	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 0.1			0.1	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 0.1			0.1	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 0.1			0.1	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 0.1			0.1	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 0.1			0.1	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Trace							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 0.1			0.1	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/kg	< 0.5			0.5	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 0.1			0.1	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 0.1			0.1	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	77			70-130	Pass	
TRH C10-C14	%	74			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	90			70-130	Pass	
Toluene	%	92			70-130	Pass	
Ethylbenzene	%	91			70-130	Pass	
m&p-Xylenes	%	92			70-130	Pass	
o-Xylene	%	92			70-130	Pass	
Xylenes - Total*	%	92			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	87			70-130	Pass	
TRH C6-C10	%	74			70-130	Pass	
TRH >C10-C16	%	72			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	98			70-130	Pass	
Acenaphthylene	%	98			70-130	Pass	
Anthracene	%	101			70-130	Pass	
Benz(a)anthracene	%	96			70-130	Pass	
Benzo(a)pyrene	%	100			70-130	Pass	
Benzo(b&j)fluoranthene	%	95			70-130	Pass	
Benzo(g.h.i)perylene	%	99			70-130	Pass	
Benzo(k)fluoranthene	%	85			70-130	Pass	
Chrysene	%	108			70-130	Pass	
Dibenz(a.h)anthracene	%	100			70-130	Pass	
Fluoranthene	%	101			70-130	Pass	
Fluorene	%	102			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	97			70-130	Pass	
Naphthalene	%	98			70-130	Pass	
Phenanthrene	%	103			70-130	Pass	
Pyrene	%	100			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	107			80-120	Pass	
Cadmium	%	106			80-120	Pass	
Chromium	%	109			80-120	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Copper	%	109			80-120	Pass	
Lead	%	110			80-120	Pass	
Mercury	%	103			80-120	Pass	
Nickel	%	107			80-120	Pass	
Zinc	%	106			80-120	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances- Trace							
Perfluorooctane sulfonamide (FOSA)	%	113			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	114			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	105			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	99			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	74			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	110			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	101			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs) - Trace							
Perfluorobutanoic acid (PFBA)	%	108			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	105			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	108			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	112			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	104			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	108			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	105			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	147			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	106			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	112			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	111			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)- Trace							
Perfluorobutanesulfonic acid (PFBS)	%	94			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	99			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	85			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	89			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	95			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	105			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	96			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	92			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Trace							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	108			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	98			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	110			50-150	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	95			70-130	Pass	
4.4'-DDD	%	100			70-130	Pass	
4.4'-DDE	%	104			70-130	Pass	
4.4'-DDT	%	104			70-130	Pass	
a-BHC	%	105			70-130	Pass	
Aldrin	%	104			70-130	Pass	
b-BHC	%	101			70-130	Pass	
d-BHC	%	126			70-130	Pass	
Dieldrin	%	102			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan I			%	99			70-130	Pass	
Endosulfan II			%	100			70-130	Pass	
Endosulfan sulphate			%	103			70-130	Pass	
Endrin			%	106			70-130	Pass	
Endrin aldehyde			%	99			70-130	Pass	
Endrin ketone			%	103			70-130	Pass	
g-BHC (Lindane)			%	104			70-130	Pass	
Heptachlor			%	107			70-130	Pass	
Heptachlor epoxide			%	103			70-130	Pass	
Hexachlorobenzene			%	100			70-130	Pass	
Methoxychlor			%	105			70-130	Pass	
LCS - % Recovery									
Polychlorinated Biphenyls									
Aroclor-1260			%	87			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S20-Jn19576	NCP	%	108			70-130	Pass	
Acenaphthylene	S20-Jn19576	NCP	%	101			70-130	Pass	
Anthracene	S20-Jn19576	NCP	%	98			70-130	Pass	
Benz(a)anthracene	S20-Jn19576	NCP	%	86			70-130	Pass	
Benzo(a)pyrene	S20-Jn19576	NCP	%	89			70-130	Pass	
Benzo(b&j)fluoranthene	S20-Jn19576	NCP	%	85			70-130	Pass	
Benzo(g.h.i)perylene	S20-Jn19576	NCP	%	88			70-130	Pass	
Benzo(k)fluoranthene	S20-Jn19576	NCP	%	106			70-130	Pass	
Chrysene	S20-Jn19576	NCP	%	98			70-130	Pass	
Dibenz(a.h)anthracene	S20-Jn19576	NCP	%	72			70-130	Pass	
Fluoranthene	S20-Jn19576	NCP	%	102			70-130	Pass	
Fluorene	S20-Jn19576	NCP	%	96			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S20-Jn19576	NCP	%	83			70-130	Pass	
Naphthalene	S20-Jn19576	NCP	%	100			70-130	Pass	
Phenanthrene	S20-Jn19576	NCP	%	95			70-130	Pass	
Pyrene	S20-Jn19576	NCP	%	100			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S20-Jn22537	NCP	%	121			75-125	Pass	
Cadmium	S20-Jn22537	NCP	%	121			75-125	Pass	
Chromium	S20-Jn22222	NCP	%	103			75-125	Pass	
Copper	S20-Jn22537	NCP	%	122			75-125	Pass	
Lead	S20-Jn22222	NCP	%	101			75-125	Pass	
Mercury	S20-Jn22222	NCP	%	105			75-125	Pass	
Nickel	S20-Jn22222	NCP	%	103			75-125	Pass	
Zinc	S20-Jn22222	NCP	%	99			75-125	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S20-Jn23442	CP	%	80			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S20-Jn23442	CP	%	104			70-130	Pass	
Toluene	S20-Jn23442	CP	%	108			70-130	Pass	
Ethylbenzene	S20-Jn23442	CP	%	106			70-130	Pass	
m&p-Xylenes	S20-Jn23442	CP	%	106			70-130	Pass	
o-Xylene	S20-Jn23442	CP	%	106			70-130	Pass	
Xylenes - Total*	S20-Jn23442	CP	%	106			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S20-Jn23442	CP	%	100			70-130	Pass	
TRH C6-C10	S20-Jn23442	CP	%	80			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S20-Jn23444	CP	%	97			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S20-Jn23444	CP	%	97			70-130	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances- Trace				Result 1					
Perfluorooctane sulfonamide (FOSA)	S20-Jn23453	CP	%	120			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S20-Jn23453	CP	%	108			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S20-Jn23453	CP	%	102			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	S20-Jn23453	CP	%	94			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	S20-Jn23453	CP	%	92			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S20-Jn23453	CP	%	106			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S20-Jn23453	CP	%	108			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs) - Trace				Result 1					
Perfluorobutanoic acid (PFBA)	S20-Jn23453	CP	%	109			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	S20-Jn23453	CP	%	107			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	S20-Jn23453	CP	%	110			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	S20-Jn23453	CP	%	103			50-150	Pass	
Perfluorooctanoic acid (PFOA)	S20-Jn23453	CP	%	110			50-150	Pass	
Perfluorononanoic acid (PFNA)	S20-Jn23453	CP	%	106			50-150	Pass	
Perfluorodecanoic acid (PFDA)	S20-Jn23453	CP	%	114			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	S20-Jn23453	CP	%	130			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	S20-Jn23453	CP	%	112			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	S20-Jn23453	CP	%	109			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S20-Jn23453	CP	%	116			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)- Trace				Result 1					
Perfluorobutanesulfonic acid (PFBS)	S20-Jn23453	CP	%	93			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	S20-Jn23453	CP	%	95			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S20-Jn23453	CP	%	91			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S20-Jn23453	CP	%	97			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S20-Jn23453	CP	%	100			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S20-Jn23453	CP	%	110			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	S20-Jn23453	CP	%	107			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorodecanesulfonic acid (PFDS)	S20-Jn23453	CP	%	98			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Trace				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S20-Jn23453	CP	%	103			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	S20-Jn23453	CP	%	115			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S20-Jn23453	CP	%	100			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S20-Jn23453	CP	%	110			50-150	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S20-Jn18210	NCP	%	103			70-130	Pass	
4.4'-DDD	S20-Jn18210	NCP	%	111			70-130	Pass	
4.4'-DDE	S20-Jn18210	NCP	%	113			70-130	Pass	
4.4'-DDT	S20-Jn18210	NCP	%	109			70-130	Pass	
a-BHC	S20-Jn18210	NCP	%	103			70-130	Pass	
Aldrin	S20-Jn18210	NCP	%	81			70-130	Pass	
b-BHC	S20-Jn18210	NCP	%	104			70-130	Pass	
d-BHC	S20-Jn18210	NCP	%	129			70-130	Pass	
Dieldrin	S20-Jn18210	NCP	%	112			70-130	Pass	
Endosulfan I	S20-Jn18210	NCP	%	106			70-130	Pass	
Endosulfan II	S20-Jn18210	NCP	%	108			70-130	Pass	
Endosulfan sulphate	S20-Jn18210	NCP	%	110			70-130	Pass	
Endrin	S20-Jn18210	NCP	%	115			70-130	Pass	
Endrin aldehyde	S20-Jn18210	NCP	%	95			70-130	Pass	
Endrin ketone	S20-Jn18210	NCP	%	107			70-130	Pass	
g-BHC (Lindane)	S20-Jn18210	NCP	%	106			70-130	Pass	
Heptachlor	S20-Jn18210	NCP	%	109			70-130	Pass	
Heptachlor epoxide	S20-Jn18210	NCP	%	110			70-130	Pass	
Hexachlorobenzene	S20-Jn18210	NCP	%	105			70-130	Pass	
Methoxychlor	S20-Jn18210	NCP	%	108			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	S20-Jn18159	NCP	%	111			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-Jn22527	NCP	mg/kg	2.7	2.4	11	30%	Pass	
Cadmium	S20-Jn22527	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-Jn22527	NCP	mg/kg	11	10	6.0	30%	Pass	
Copper	S20-Jn22527	NCP	mg/kg	7.2	9.2	24	30%	Pass	
Lead	S20-Jn22527	NCP	mg/kg	15	13	14	30%	Pass	
Mercury	S20-Jn22527	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-Jn22527	NCP	mg/kg	10	15	39	30%	Fail	Q15
Zinc	S20-Jn22527	NCP	mg/kg	27	28	2.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S20-Jn22879	NCP	%	21	20	3.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S20-Jn23441	CP	mg/kg	< 20	< 20	<1	30%	Pass	

Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S20-Jn23441	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S20-Jn23441	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S20-Jn23441	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S20-Jn23441	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S20-Jn23441	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S20-Jn23441	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S20-Jn23441	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S20-Jn23441	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S20-Jn23443	CP	mg/kg	22	28	26	30%	Pass	
TRH C15-C28	S20-Jn23443	CP	mg/kg	460	620	31	30%	Fail	Q15
TRH C29-C36	S20-Jn23443	CP	mg/kg	510	670	26	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S20-Jn23443	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S20-Jn23443	CP	mg/kg	880	1200	29	30%	Pass	
TRH >C34-C40	S20-Jn23443	CP	mg/kg	380	460	20	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S20-Jn23453	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S20-Jn23453	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S20-Jn23453	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S20-Jn23453	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S20-Jn23453	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S20-Jn23453	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Benzo(a)pyrene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S20-Jn26965	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S20-Jn26965	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S20-Jn26965	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S20-Jn26965	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1221	S20-Jn26965	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S20-Jn26965	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S20-Jn26965	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S20-Jn26965	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S20-Jn26965	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S20-Jn26965	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Comments

This report has been revised (V2) to report trace level LOR for sample S20-Jn23453.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).
Q02	The duplicate %RPD is outside the recommended acceptance criteria. Further analysis indicates sample heterogeneity as the cause
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Alena Bounkeua	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)
Sarah McCallion	Senior Analyst-PFAS (QLD)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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☐ **Sydney**
Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
Phone: +612 9900 8400
Email: enviro.syd@mgtlabmark.com.au

☐ **Brisbane**
Unit 1-21 Smallwood Place, Murrarie
Phone: +617 3902 4600
Email: enviro.bris@mgtlabmark.com.au

☐ **Melbourne**
2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 8564 5000 Fax: +613 8564 5090
Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Page ____ of ____

Company Name : GHD
Office Address : 24 Honeysuckle Drive
Newcastle 2300

Contact Name: Joanna Sylvester
Project Manager : Joanna Sylvester
Email for results : Andrew Braitlin / Joanna Sylvester

Purchase Order : 12520831
PROJECT Number : 12520831
PROJECT Name :

COC Number :
Eurofins | mgt quote ID : 141113GHDN
Data output format:

Special Directions & Comments :
Please analyse the following as composite sample for Suite B13:

COMP 1 - TP205_0.0-0.1 , TP204_0.0-0.1 and TP203_0.0-0.1

COMP 2 - TP206_0.0-0.1, TP207_0.0-0.1 and TP208_0.0-0.1

COMP 3 - HA201_0.2-0.3, TP202_0.2-0.3 and TP206_0.2-0.3

COMP 4 - TP204_0.5-0.6, TP205_0.5-0.6 and TP203_0.5-0.6

Analytes

	Sample ID	Date	Matrix	Suite B1 (TRH/BTEXN)	Heavy metals (As, Cd, Cr,Cu, Ni, Pb, Zn, Hg	Asbestos	PAHs	Suite B13 (OCPs / PCBS) - Comp
1	HA201_0.0-0.1	10/06/2020	S	X	X	X	X	
2	FD03	10/06/2020	S					
3	HA201_0.2-0.3	10/06/2020	S	X	X		X	
4	TP202_0.0-0.1	10/06/2020	S	X	X	X	X	
5	TP202_0.2_0.3	10/06/2020	S	X	X		X	
6	TP202_0.5-0.6	10/06/2020	S					
7	TP202_1.0-1.1	10/06/2020	S					
8	TP203_0.0-0.1	10/06/2020	S	X	X	X	X	
9	TP203_0.2-0.3	10/06/2020	S	X	X		X	
10	FD02	10/06/2020	S					
11	TP203_0.5-0.6	10/06/2020	S					
12	TP203_1.0-1.1	10/06/2020	S					
13	TP204_0.0-0.1	10/06/2020	S	X	X	X	X	
14	TP204_0.2-0.3	10/06/2020	S	X	X		X	
15	TP204_0.5-0.6	10/06/2020	S					
16	TP204_1.0-1.1	10/06/2020	S					
17	TP204_1.5-1-6	10/06/2020	S					
18	TP205_0.0-0.1	10/06/2020	S	X	X	X	X	
19	TP205_1.0-1.1	10/06/2020	S					

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:								Sample comments:
1000P	500P	250P	60P	1000A	500A	125A	40Vial	

Relinquished By:
Andrew Braitlin
Date & Time::
43997
Signature:

Laboratory Staff
Received By: Elvis D
Date & Time: 15/6/20 11.49AM
Signature:

Turn around time
1 DAY ☐ 2 DAY ☐ 3 DAY ☐
5 DAY ☑ 10 DAY ☐ Other:

Method Of Shipment
☐ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival: 20.2°
Report number: 725536

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☐ **Sydney**
Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
Phone: +612 9900 8400
Email: enviro.syd@mgtlabmark.com.au

☐ **Brisbane**
Unit 1-21 Smallwood Place, Murrarie
Phone: +617 3902 4600
Email: enviro.bris@mgtlabmark.com.au

☐ **Melbourne**
2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 8564 5000 Fax: +613 8564 5090
Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Page ______ of ______

Company Name : GHD

Office Address : 24 Honeysuckle Drive
Newcastle 2300

Contact Name: Joanna Sylvester

Project Manager : Joanna Sylvester

Email for results : Andrew Braith / Joanna Sylvester

Purchase Order : 12520831

PROJECT Number : 12520831

PROJECT Name :

COC Number :

Eurofins | mgt quote ID : 141113GHDN

Data output format:

Special Directions & Comments :

Eurofins | mgt DI water batch number:

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous Iron	7 days	ASLP, TCLP	7 days

	Sample ID	Date	Matrix	Suite B1 (TRH/BTEXN)	Heavy metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)	Asbestos	PAHs	Suite 13B (OCPS/PCBs)	Hold	PFAS	1000P	500P	250P	60P	1000A	500A	125A	40Vial	Sample comments:
1	TP205_0.5-0.6	10/06/2020	S	X	X	X	X												
2	FD01	10/06/2020	S	X	X		X												
3	TP205_1.5-1.6	10/06/2020	S																
4	TP206_0.0-0.1	10/06/2020	S	X	X	X	X												
5	TP206_0.2-0.3	10/06/2020	S																
6	TP206_0.5-0.6	10/06/2020	S	X	X		X												
7	TP206_1.0-1.1	10/06/2020	S																
8	TP206_1.5-1.6	10/06/2020	S																
9	TP207_0.0-0.1	10/06/2020	S	X	X	X	X												
10	TP207_0.2-0.3	10/06/2020	S	X	X		X			X									PFAS sample
11	FD04	10/06/2020	S																PFAS sample
12	TP208_0.0-0.1	10/06/2020	S	X	X	X	X												
13	FD05	10/06/2020	S	X	X		X												
14	TP208_0.2-0.3	10/06/2020	S	X	X		X												PFAS sample
15	TP208_0.5-0.6	10/06/2020	S																
16	TP208_1.0-1.1	10/06/2020	S																
17																			
18																			
19																			

Relinquished By:

Date & Time::

Signature:

Laboratory Staff

Received By: Elvis D

Date & Time: 15/6/20 11:49AM

Signature:

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐
5 DAY ☐ 10 DAY ☐ Other:

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal

Courier Consignment # :

Temperature on arrival: 20.2°c

Report number: 725536

QS3009_R0 Issue Date: 25 February 2013 Page 1 of 1

eurofins | Environment Testing

Melbourne
6 Monterey Road
Dandenong South Vic 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**GHD Pty Ltd NEWCASTLE**
Contact name:	Andrew Brajlih
Project ID:	12520831
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Jun 15, 2020 11:49 AM
Eurofins reference:	**725536**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins Sample Receipt : 20.2 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Andrew Black on Phone : (+61) 2 9900 8490 or by e.mail: AndrewBlack@eurofins.com

Results will be delivered electronically via e.mail to Andrew Brajlih - Andrew.Brajlih@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd NEWCASTLE email address.

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

GHD Pty Ltd
3/24 Honeysuckle Dve
Newcastle
NSW 2300

Attention:	Andrew Brajlih
Report	725536-AID
Project Name	
Project ID	12520831
Received Date	Jun 15, 2020
Date Reported	Jun 22, 2020

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name
Project ID 12520831
Date Sampled Jun 10, 2020
Report 725536-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
HA201_0.0-0.1	20-Jn23439	Jun 10, 2020	Approximate Sample 49g Sample consisted of: Grey fine grain sand and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP202_0.0-0.1	20-Jn23441	Jun 10, 2020	Approximate Sample 50g Sample consisted of: Brown fine-grained soil, grey fine grain sand, rocks and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP203_0.0-0.1	20-Jn23443	Jun 10, 2020	Approximate Sample 48g Sample consisted of: Brown coarse-grained soil, grey fine grain sand, rocks and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP204_0.0-0.1	20-Jn23445	Jun 10, 2020	Approximate Sample 43g Sample consisted of: Brown coarse-grained soil, grey fine grain sand, rocks and organic debris	Chrysotile asbestos detected in the form of loose fibre bundles. Approximate dimensions of fibre bundle = 0.5x<0.5x<0.5mm. Organic fibre detected. No trace asbestos detected.
TP205_0.0-0.1	20-Jn23447	Jun 10, 2020	Approximate Sample 54g Sample consisted of: Brown coarse-grained soil and rocks and cement fragments	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP205_0.5-0.6	20-Jn23448	Jun 10, 2020	Approximate Sample 68g Sample consisted of: Brown coarse-grained soil and rocks, cement fragments and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP206_0.0-0.1	20-Jn23450	Jun 10, 2020	Approximate Sample 53g Sample consisted of: Grey fine-grained sand, rocks and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
TP207_0.0-0.1	20-Jn23452	Jun 10, 2020	Approximate Sample 71g Sample consisted of: Grey fine-grained sand, rocks and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP208_0.0-0.1	20-Jn23454	Jun 10, 2020	Approximate Sample 100g Sample consisted of: Yellow fine-grained sand and organic dbris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	**Testing Site**	**Extracted**	**Holding Time**
Asbestos - LTM-ASB-8020	Sydney	Jun 15, 2020	Indefinite

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Project Name:
Project ID: 12520831

Order No.: 12520831
Report #: 725536
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Jun 15, 2020 11:49 AM
Due: Jun 22, 2020
Priority: 5 Day
Contact Name: Andrew Brajlih

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Suite B13: OCP/PCB	Moisture Set	Eurofins | mgt Suite B1	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794													X
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	HA201_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23439	X		X	X		X	X	
2	HA201_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23440			X	X		X	X	
3	TP202_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23441	X		X	X		X	X	
4	TP202_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23442			X	X		X	X	
5	TP203_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23443	X		X	X		X	X	
6	TP203_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23444			X	X		X	X	
7	TP204_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23445	X		X	X		X	X	
8	TP204_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23446			X	X		X	X	
9	TP205_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23447	X		X	X		X	X	
10	TP205_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23448	X		X	X		X	X	

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Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794													X
Perth Laboratory - NATA Site # 23736													
11	FD01	Jun 10, 2020		Soil	S20-Jn23449			X	X		X	X	
12	TP206_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23450	X		X	X		X	X	
13	TP206_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23451			X	X		X	X	
14	TP207_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23452	X		X	X		X	X	
15	TP207_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23453			X	X		X	X	X
16	TP208_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23454	X		X	X		X	X	
17	FD05	Jun 10, 2020		Soil	S20-Jn23455			X	X		X	X	
18	TP208_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23456			X	X		X	X	
19	COMP 1	Jun 10, 2020		Soil	S20-Jn23457					X	X		
20	COMP 2	Jun 10, 2020		Soil	S20-Jn23458					X	X		
21	COMP 3	Jun 10, 2020		Soil	S20-Jn23459					X	X		
22	COMP 4	Jun 10, 2020		Soil	S20-Jn23460					X	X		
23	FD03	Jun 10, 2020		Soil	S20-Jn23461		X						

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Sample Detail						Asbestos - AS4964	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Suite B13: OCP/PCB	Moisture Set	Eurofins | mgt Suite B1	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794													X
Perth Laboratory - NATA Site # 23736													
24	TP202_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23462		X						
25	TP202_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23463		X						
26	FD02	Jun 10, 2020		Soil	S20-Jn23464		X						
27	TP203_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23465		X						
28	TP203_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23466		X						
29	TP204_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23467		X						
30	TP204_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23468		X						
31	TP204_1.5-1.6	Jun 10, 2020		Soil	S20-Jn23469		X						
32	TP205_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23470		X						
33	TP205_1.5-1.6	Jun 10, 2020		Soil	S20-Jn23471		X						
34	TP206_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23472		X						
35	TP206_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23473		X						
36	TP206_1.5-1.6	Jun 10, 2020		Soil	S20-Jn23474		X						

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Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Suite B13: OCP/PCB	Moisture Set	Eurofins | mgt Suite B1	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794													X
Perth Laboratory - NATA Site # 23736													
37	FD04	Jun 10, 2020		Soil	S20-Jn23475		X						
38	TP208_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23476		X						
39	TP208_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23477		X						
Test Counts						9	17	18	18	4	22	18	1

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

The samples received were not collected in an approved asbestos bag and was therefore sub-sampled from the 250mL glass jar. Valid sub-sampling procedures were applied so as to ensure that the sub-samples to be analysed accurately represented the samples received.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Sayeed Abu	Senior Analyst-Asbestos (NSW)

Authorised by:

Chamath JHM Annakkage	Senior Analyst-Asbestos (NSW)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

GHD Pty Ltd
3/24 Honeysuckle Dve
Newcastle
NSW 2300

Attention:	**Andrew Brajlih**
Report	**725536-S**
Project name	
Project ID	12520831
Received Date	Jun 15, 2020

Client Sample ID **Sample Matrix** **Eurofins Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**HA201_0.0-0.1** **Soil** **S20-Jn23439** **Jun 10, 2020**	**HA201_0.2-0.3** **Soil** **S20-Jn23440** **Jun 10, 2020**	**TP202_0.0-0.1** **Soil** **S20-Jn23441** **Jun 10, 2020**	**TP202_0.2-0.3** **Soil** **S20-Jn23442** **Jun 10, 2020**
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	33	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	480	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	780	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	1293	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	0.2	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	90	87	99	73
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	1100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	650	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	1750	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			**HA201_0.0-0.1**	**HA201_0.2-0.3**	**TP202_0.0-0.1**	**TP202_0.2-0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Jn23439**	**S20-Jn23440**	**S20-Jn23441**	**S20-Jn23442**
Date Sampled			**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	97	85	98	123
p-Terphenyl-d14 (surr.)	1	%	107	99	108	135
Heavy Metals						
Arsenic	2	mg/kg	2.5	2.8	4.0	2.1
Cadmium	0.4	mg/kg	< 0.4	< 0.4	5.4	< 0.4
Chromium	5	mg/kg	< 5	< 5	27	< 5
Copper	5	mg/kg	< 5	< 5	450	8.6
Lead	5	mg/kg	5.8	< 5	130	< 5
Mercury	0.1	mg/kg	< 0.1	< 0.1	2.0	< 0.1
Nickel	5	mg/kg	< 5	< 5	15	< 5
Zinc	5	mg/kg	17	< 5	730	8.2
% Moisture	1	%	9.4	< 1	18	1.8

Client Sample ID			**TP203_0.0-0.1**	**TP203_0.2-0.3**	**TP204_0.0-0.1**	**TP204_0.2-0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Jn23443**	**S20-Jn23444**	**S20-Jn23445**	**S20-Jn23446**
Date Sampled			**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	22	< 20	42	< 20
TRH C15-C28	50	mg/kg	460	< 50	470	< 50
TRH C29-C36	50	mg/kg	510	< 50	730	< 50
TRH C10-C36 (Total)	50	mg/kg	992	< 50	1242	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	90	51	55	101
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	51	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	51	< 50
TRH >C16-C34	100	mg/kg	880	< 100	1000	< 100

Client Sample ID			**TP203_0.0-0.1**	**TP203_0.2-0.3**	**TP204_0.0-0.1**	**TP204_0.2-0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Jn23443**	**S20-Jn23444**	**S20-Jn23445**	**S20-Jn23446**
Date Sampled			**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C34-C40	100	mg/kg	380	< 100	620	< 100
TRH >C10-C40 (total)*	100	mg/kg	1260	< 100	1671	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	96	105	79	110
p-Terphenyl-d14 (surr.)	1	%	121	121	88	124
Heavy Metals						
Arsenic	2	mg/kg	3.3	< 2	3.0	< 2
Cadmium	0.4	mg/kg	1.5	< 0.4	3.1	< 0.4
Chromium	5	mg/kg	11	< 5	23	< 5
Copper	5	mg/kg	230	< 5	370	< 5
Lead	5	mg/kg	60	< 5	130	< 5
Mercury	0.1	mg/kg	1.1	< 0.1	2.3	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	150	13	260	47
% Moisture	1	%	14	1.4	22	8.8

Client Sample ID			**TP205_0.0-0.1**	**TP205_0.5-0.6**	**FD01**	**TP206_0.0-0.1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Jn23447**	**S20-Jn23448**	**S20-Jn23449**	**S20-Jn23450**
Date Sampled			**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	57	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	57	< 50	< 50

Client Sample ID **Sample Matrix** **Eurofins Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**TP205_0.0-0.1** **Soil** **S20-Jn23447** **Jun 10, 2020**	**TP205_0.5-0.6** **Soil** **S20-Jn23448** **Jun 10, 2020**	**FD01** **Soil** **S20-Jn23449** **Jun 10, 2020**	**TP206_0.0-0.1** **Soil** **S20-Jn23450** **Jun 10, 2020**
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	90	67	105	97
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	96	94	94	97
p-Terphenyl-d14 (surr.)	1	%	97	98	99	102
Heavy Metals						
Arsenic	2	mg/kg	5.2	6.8	2.8	2.7
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	12	< 5	< 5
Copper	5	mg/kg	10	6.9	< 5	< 5
Lead	5	mg/kg	19	14	43	< 5
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	170	100	56	7.4
% Moisture	1	%	5.9	9.8	10	9.0

Client Sample ID			**TP206_0.5-0.6**	**TP207_0.0-0.1**	**TP207_0.2-0.3**	**TP208_0.0-0.1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Jn23451**	**S20-Jn23452**	**S20-Jn23453**	**S20-Jn23454**
Date Sampled			**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	83	69	72	90
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	98	101	98	92
p-Terphenyl-d14 (surr.)	1	%	102	103	100	98

Client Sample ID			**TP206_0.5-0.6**	**TP207_0.0-0.1**	**TP207_0.2-0.3**	**TP208_0.0-0.1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Jn23451**	**S20-Jn23452**	**S20-Jn23453**	**S20-Jn23454**
Date Sampled			**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	3.3	< 2	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	< 5	< 5	< 5
Copper	5	mg/kg	< 5	< 5	< 5	< 5
Lead	5	mg/kg	< 5	< 5	< 5	< 5
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	8.4	15	< 5	< 5
% Moisture	1	%	11	1.3	11	2.5
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	-	-	< 5	-
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	-	-	< 5	-
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	-	-	< 5	-
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	-	-	< 5	-
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	-	-	< 5	-
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	-	-	< 5	-
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	-	-	< 5	-
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	-	-	< 5	-
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	-	-	< 5	-
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	-	-	< 5	-
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	-	-	< 5	-
13C4-PFBA (surr.)	1	%	-	-	92	-
13C5-PFPeA (surr.)	1	%	-	-	103	-
13C5-PFHxA (surr.)	1	%	-	-	111	-
13C4-PFHpA (surr.)	1	%	-	-	96	-
13C8-PFOA (surr.)	1	%	-	-	99	-
13C5-PFNA (surr.)	1	%	-	-	103	-
13C6-PFDA (surr.)	1	%	-	-	120	-
13C2-PFUnDA (surr.)	1	%	-	-	130	-
13C2-PFDoDA (surr.)	1	%	-	-	77	-
13C2-PFTeDA (surr.)	1	%	-	-	90	-
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	-	-	< 5	-
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	-	-	< 5	-
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	-	-	< 5	-
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	5	ug/kg	-	-	< 5	-
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	5	ug/kg	-	-	< 5	-
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	-	-	< 10	-
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	-	-	< 10	-
13C8-FOSA (surr.)	1	%	-	-	71	-
D3-N-MeFOSA (surr.)	1	%	-	-	122	-
D5-N-EtFOSA (surr.)	1	%	-	-	148	-
D7-N-MeFOSE (surr.)	1	%	-	-	100	-
D9-N-EtFOSE (surr.)	1	%	-	-	93	-
D5-N-EtFOSAA (surr.)	1	%	-	-	95	-
D3-N-MeFOSAA (surr.)	1	%	-	-	95	-

Client Sample ID			TP206_0.5-0.6	TP207_0.0-0.1	TP207_0.2-0.3	TP208_0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Jn23451	S20-Jn23452	S20-Jn23453	S20-Jn23454
Date Sampled			Jun 10, 2020	Jun 10, 2020	Jun 10, 2020	Jun 10, 2020
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	-	-	< 5	-
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	-	-	< 5	-
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	-	-	< 5	-
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	-	-	< 5	-
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	-	-	< 5	-
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	-	-	< 5	-
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	-	-	< 5	-
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	-	-	< 5	-
13C3-PFBS (surr.)	1	%	-	-	99	-
18O2-PFHxS (surr.)	1	%	-	-	99	-
13C8-PFOS (surr.)	1	%	-	-	98	-
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	-	-	< 5	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	10	ug/kg	-	-	< 10	-
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	-	-	< 5	-
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	-	-	< 5	-
13C2-4:2 FTSA (surr.)	1	%	-	-	82	-
13C2-6:2 FTSA (surr.)	1	%	-	-	85	-
13C2-8:2 FTSA (surr.)	1	%	-	-	104	-
13C2-10:2 FTSA (surr.)	1	%	-	-	84	-
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	-	-	< 5	-
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	-	-	< 5	-
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	-	-	< 5	-
Sum of WA DWER PFAS (n=10)*	10	ug/kg	-	-	< 10	-
Sum of PFASs (n=30)*	50	ug/kg	-	-	< 50	-

Client Sample ID			FD05	TP208_0.2-0.3	COMP 1	COMP 2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Jn23455	S20-Jn23456	S20-Jn23457	S20-Jn23458
Date Sampled			Jun 10, 2020	Jun 10, 2020	Jun 10, 2020	Jun 10, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	-	-
TRH C10-C14	20	mg/kg	< 20	< 20	-	-
TRH C15-C28	50	mg/kg	< 50	< 50	-	-
TRH C29-C36	50	mg/kg	< 50	< 50	-	-
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	-	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	-	-
Toluene	0.1	mg/kg	< 0.1	< 0.1	-	-
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	-	-
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	-	-
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	-	-
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	-	-
4-Bromofluorobenzene (surr.)	1	%	109	77	-	-

Client Sample ID **Sample Matrix** **Eurofins Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**FD05** **Soil** **S20-Jn23455** **Jun 10, 2020**	**TP208_0.2-0.3** **Soil** **S20-Jn23456** **Jun 10, 2020**	**COMP 1** **Soil** **S20-Jn23457** **Jun 10, 2020**	**COMP 2** **Soil** **S20-Jn23458** **Jun 10, 2020**
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	< 0.5	< 0.5	-	-
TRH C6-C10	20	mg/kg	< 20	< 20	-	-
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	< 20	< 20	-	-
TRH >C10-C16	50	mg/kg	< 50	< 50	-	-
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	-	-
TRH >C16-C34	100	mg/kg	< 100	< 100	-	-
TRH >C34-C40	100	mg/kg	< 100	< 100	-	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	-	-
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	-	-
Anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Chrysene	0.5	mg/kg	< 0.5	< 0.5	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Fluorene	0.5	mg/kg	< 0.5	< 0.5	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	-	-
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	-	-
2-Fluorobiphenyl (surr.)	1	%	96	93	-	-
p-Terphenyl-d14 (surr.)	1	%	101	97	-	-
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	-	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	-	-
Chromium	5	mg/kg	< 5	< 5	-	-
Copper	5	mg/kg	< 5	< 5	-	-
Lead	5	mg/kg	< 5	< 5	-	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	-	-
Nickel	5	mg/kg	< 5	< 5	-	-
Zinc	5	mg/kg	6.0	7.3	-	-
% Moisture	1	%	7.2	11	19	6.2
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	0.2	< 0.1
4.4'-DDD	0.05	mg/kg	-	-	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	-	-	< 0.05	< 0.05
a-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
Aldrin	0.05	mg/kg	-	-	< 0.05	< 0.05

Client Sample ID			FD05	TP208_0.2-0.3	COMP 1	COMP 2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Jn23455**	**S20-Jn23456**	**S20-Jn23457**	**S20-Jn23458**
Date Sampled			**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
b-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
d-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	-	-	0.12	< 0.05
Endosulfan I	0.05	mg/kg	-	-	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	-	-	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	-	-	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	-	-	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	-	-	< 0.2	< 0.2
Toxaphene	1	mg/kg	-	-	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	0.12	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	0.32	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	0.2	< 0.2
Dibutylchlorendate (surr.)	1	%	-	-	118	59
Tetrachloro-m-xylene (surr.)	1	%	-	-	135	82
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	-	-	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	-	-	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	-	-	118	59
Tetrachloro-m-xylene (surr.)	1	%	-	-	135	82

Client Sample ID			COMP 3	COMP 4
Sample Matrix			**Soil**	**Soil**
Eurofins Sample No.			**S20-Jn23459**	**S20-Jn23460**
Date Sampled			**Jun 10, 2020**	**Jun 10, 2020**
Test/Reference	LOR	Unit		
% Moisture	1	%	6.4	6.6
Organochlorine Pesticides				
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05

Client Sample ID			**COMP 3**	**COMP 4**
Sample Matrix			**Soil**	**Soil**
Eurofins Sample No.			**S20-Jn23459**	**S20-Jn23460**
Date Sampled			**Jun 10, 2020**	**Jun 10, 2020**
Test/Reference	LOR	Unit		
Organochlorine Pesticides				
d-BHC	0.05	mg/kg	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2
Dibutylchlorendate (surr.)	1	%	74	55
Tetrachloro-m-xylene (surr.)	1	%	93	78
Polychlorinated Biphenyls				
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	74	55
Tetrachloro-m-xylene (surr.)	1	%	93	78

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jun 19, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Jun 19, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jun 19, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jun 19, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Jun 19, 2020	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Jun 19, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Jun 15, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Jun 18, 2020	180 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Jun 18, 2020	180 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Jun 18, 2020	180 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Jun 18, 2020	180 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Organochlorine Pesticides	Sydney	Jun 19, 2020	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Sydney	Jun 19, 2020	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Order No.: 12520831
Report #: 725536
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Jun 15, 2020 11:49 AM
Due: Jun 22, 2020
Priority: 5 Day
Contact Name: Andrew Brajlih

Project Name:
Project ID: 12520831

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Suite B13: OCP/PCB	Moisture Set	Eurofins | mgt Suite B1	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794													X
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	HA201_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23439	X		X	X		X	X	
2	HA201_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23440			X	X		X	X	
3	TP202_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23441	X		X	X		X	X	
4	TP202_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23442			X	X		X	X	
5	TP203_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23443	X		X	X		X	X	
6	TP203_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23444			X	X		X	X	
7	TP204_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23445	X		X	X		X	X	
8	TP204_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23446			X	X		X	X	
9	TP205_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23447	X		X	X		X	X	
10	TP205_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23448	X		X	X		X	X	

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Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794													X
Perth Laboratory - NATA Site # 23736													
11	FD01	Jun 10, 2020		Soil	S20-Jn23449			X	X		X	X	
12	TP206_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23450	X		X	X		X	X	
13	TP206_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23451			X	X		X	X	
14	TP207_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23452	X		X	X		X	X	
15	TP207_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23453			X	X		X	X	X
16	TP208_0.0-0.1	Jun 10, 2020		Soil	S20-Jn23454	X		X	X		X	X	
17	FD05	Jun 10, 2020		Soil	S20-Jn23455			X	X		X	X	
18	TP208_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23456			X	X		X	X	
19	COMP 1	Jun 10, 2020		Soil	S20-Jn23457					X	X		
20	COMP 2	Jun 10, 2020		Soil	S20-Jn23458					X	X		
21	COMP 3	Jun 10, 2020		Soil	S20-Jn23459					X	X		
22	COMP 4	Jun 10, 2020		Soil	S20-Jn23460					X	X		
23	FD03	Jun 10, 2020		Soil	S20-Jn23461		X						

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Sample Detail						Asbestos - AS4964	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Suite B13: OCP/PCB	Moisture Set	Eurofins | mgt Suite B1	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794													X
Perth Laboratory - NATA Site # 23736													
24	TP202_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23462		X						
25	TP202_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23463		X						
26	FD02	Jun 10, 2020		Soil	S20-Jn23464		X						
27	TP203_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23465		X						
28	TP203_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23466		X						
29	TP204_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23467		X						
30	TP204_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23468		X						
31	TP204_1.5-1.6	Jun 10, 2020		Soil	S20-Jn23469		X						
32	TP205_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23470		X						
33	TP205_1.5-1.6	Jun 10, 2020		Soil	S20-Jn23471		X						
34	TP206_0.2-0.3	Jun 10, 2020		Soil	S20-Jn23472		X						
35	TP206_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23473		X						
36	TP206_1.5-1.6	Jun 10, 2020		Soil	S20-Jn23474		X						

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Sample Detail						Asbestos - AS4964	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Suite B13: OCP/PCB	Moisture Set	Eurofins | mgt Suite B1	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794													X
Perth Laboratory - NATA Site # 23736													
37	FD04	Jun 10, 2020		Soil	S20-Jn23475		X						
38	TP208_0.5-0.6	Jun 10, 2020		Soil	S20-Jn23476		X						
39	TP208_1.0-1.1	Jun 10, 2020		Soil	S20-Jn23477		X						
Test Counts						9	17	18	18	4	22	18	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	77			70-130	Pass	
TRH C10-C14	%	74			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	90			70-130	Pass	
Toluene	%	92			70-130	Pass	
Ethylbenzene	%	91			70-130	Pass	
m&p-Xylenes	%	92			70-130	Pass	
o-Xylene	%	92			70-130	Pass	
Xylenes - Total*	%	92			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	87			70-130	Pass	
TRH C6-C10	%	74			70-130	Pass	
TRH >C10-C16	%	72			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	98			70-130	Pass	
Acenaphthylene	%	98			70-130	Pass	
Anthracene	%	101			70-130	Pass	
Benz(a)anthracene	%	96			70-130	Pass	
Benzo(a)pyrene	%	100			70-130	Pass	
Benzo(b&j)fluoranthene	%	95			70-130	Pass	
Benzo(g.h.i)perylene	%	99			70-130	Pass	
Benzo(k)fluoranthene	%	85			70-130	Pass	
Chrysene	%	108			70-130	Pass	
Dibenz(a.h)anthracene	%	100			70-130	Pass	
Fluoranthene	%	101			70-130	Pass	
Fluorene	%	102			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	97			70-130	Pass	
Naphthalene	%	98			70-130	Pass	
Phenanthrene	%	103			70-130	Pass	
Pyrene	%	100			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	107			70-130	Pass	
Cadmium	%	106			70-130	Pass	
Chromium	%	109			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Copper	%	109			70-130	Pass	
Lead	%	110			70-130	Pass	
Mercury	%	103			70-130	Pass	
Nickel	%	107			70-130	Pass	
Zinc	%	106			70-130	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	108			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	105			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	108			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	112			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	104			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	108			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	105			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	106			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	112			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	147			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	111			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	113			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	114			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	105			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	99			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	74			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	110			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	101			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	94			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	99			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	85			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	89			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	95			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	105			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	96			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	92			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	108			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	98			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	110			50-150	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	95			70-130	Pass	
4.4'-DDD	%	100			70-130	Pass	
4.4'-DDE	%	104			70-130	Pass	
4.4'-DDT	%	104			70-130	Pass	
a-BHC	%	105			70-130	Pass	
Aldrin	%	104			70-130	Pass	
b-BHC	%	101			70-130	Pass	
d-BHC	%	126			70-130	Pass	
Dieldrin	%	102			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan I			%	99			70-130	Pass	
Endosulfan II			%	100			70-130	Pass	
Endosulfan sulphate			%	103			70-130	Pass	
Endrin			%	106			70-130	Pass	
Endrin aldehyde			%	99			70-130	Pass	
Endrin ketone			%	103			70-130	Pass	
g-BHC (Lindane)			%	104			70-130	Pass	
Heptachlor			%	107			70-130	Pass	
Heptachlor epoxide			%	103			70-130	Pass	
Hexachlorobenzene			%	100			70-130	Pass	
Methoxychlor			%	105			70-130	Pass	
LCS - % Recovery									
Polychlorinated Biphenyls									
Aroclor-1260			%	87			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S20-Jn19576	NCP	%	108			70-130	Pass	
Acenaphthylene	S20-Jn19576	NCP	%	101			70-130	Pass	
Anthracene	S20-Jn19576	NCP	%	98			70-130	Pass	
Benz(a)anthracene	S20-Jn19576	NCP	%	86			70-130	Pass	
Benzo(a)pyrene	S20-Jn19576	NCP	%	89			70-130	Pass	
Benzo(b&j)fluoranthene	S20-Jn19576	NCP	%	85			70-130	Pass	
Benzo(g.h.i)perylene	S20-Jn19576	NCP	%	88			70-130	Pass	
Benzo(k)fluoranthene	S20-Jn19576	NCP	%	106			70-130	Pass	
Chrysene	S20-Jn19576	NCP	%	98			70-130	Pass	
Dibenz(a.h)anthracene	S20-Jn19576	NCP	%	72			70-130	Pass	
Fluoranthene	S20-Jn19576	NCP	%	102			70-130	Pass	
Fluorene	S20-Jn19576	NCP	%	96			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S20-Jn19576	NCP	%	83			70-130	Pass	
Naphthalene	S20-Jn19576	NCP	%	100			70-130	Pass	
Phenanthrene	S20-Jn19576	NCP	%	95			70-130	Pass	
Pyrene	S20-Jn19576	NCP	%	100			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S20-Jn22537	NCP	%	121			70-130	Pass	
Cadmium	S20-Jn22537	NCP	%	121			70-130	Pass	
Chromium	S20-Jn22222	NCP	%	103			70-130	Pass	
Copper	S20-Jn22537	NCP	%	122			70-130	Pass	
Lead	S20-Jn22222	NCP	%	101			70-130	Pass	
Mercury	S20-Jn22222	NCP	%	105			70-130	Pass	
Nickel	S20-Jn22222	NCP	%	103			70-130	Pass	
Zinc	S20-Jn22222	NCP	%	99			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S20-Jn23442	CP	%	80			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S20-Jn23442	CP	%	104			70-130	Pass	
Toluene	S20-Jn23442	CP	%	108			70-130	Pass	
Ethylbenzene	S20-Jn23442	CP	%	106			70-130	Pass	
m&p-Xylenes	S20-Jn23442	CP	%	106			70-130	Pass	
o-Xylene	S20-Jn23442	CP	%	106			70-130	Pass	
Xylenes - Total*	S20-Jn23442	CP	%	106			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S20-Jn23442	CP	%	100			70-130	Pass	
TRH C6-C10	S20-Jn23442	CP	%	80			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S20-Jn23444	CP	%	97			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S20-Jn23444	CP	%	97			70-130	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	S20-Jn23453	CP	%	109			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	S20-Jn23453	CP	%	107			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	S20-Jn23453	CP	%	110			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	S20-Jn23453	CP	%	103			50-150	Pass	
Perfluorooctanoic acid (PFOA)	S20-Jn23453	CP	%	110			50-150	Pass	
Perfluorononanoic acid (PFNA)	S20-Jn23453	CP	%	106			50-150	Pass	
Perfluorodecanoic acid (PFDA)	S20-Jn23453	CP	%	114			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	S20-Jn23453	CP	%	112			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	S20-Jn23453	CP	%	109			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	S20-Jn23453	CP	%	130			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S20-Jn23453	CP	%	116			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	S20-Jn23453	CP	%	120			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S20-Jn23453	CP	%	108			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S20-Jn23453	CP	%	102			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	S20-Jn23453	CP	%	94			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	S20-Jn23453	CP	%	92			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S20-Jn23453	CP	%	106			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S20-Jn23453	CP	%	108			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	S20-Jn23453	CP	%	93			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	S20-Jn23453	CP	%	95			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S20-Jn23453	CP	%	91			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S20-Jn23453	CP	%	97			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S20-Jn23453	CP	%	100			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S20-Jn23453	CP	%	110			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	S20-Jn23453	CP	%	107			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorodecanesulfonic acid (PFDS)	S20-Jn23453	CP	%	98			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S20-Jn23453	CP	%	103			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	S20-Jn23453	CP	%	115			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S20-Jn23453	CP	%	100			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S20-Jn23453	CP	%	110			50-150	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S20-Jn18210	NCP	%	103			70-130	Pass	
4.4'-DDD	S20-Jn18210	NCP	%	111			70-130	Pass	
4.4'-DDE	S20-Jn18210	NCP	%	113			70-130	Pass	
4.4'-DDT	S20-Jn18210	NCP	%	109			70-130	Pass	
a-BHC	S20-Jn18210	NCP	%	103			70-130	Pass	
Aldrin	S20-Jn18210	NCP	%	81			70-130	Pass	
b-BHC	S20-Jn18210	NCP	%	104			70-130	Pass	
d-BHC	S20-Jn18210	NCP	%	129			70-130	Pass	
Dieldrin	S20-Jn18210	NCP	%	112			70-130	Pass	
Endosulfan I	S20-Jn18210	NCP	%	106			70-130	Pass	
Endosulfan II	S20-Jn18210	NCP	%	108			70-130	Pass	
Endosulfan sulphate	S20-Jn18210	NCP	%	110			70-130	Pass	
Endrin	S20-Jn18210	NCP	%	115			70-130	Pass	
Endrin aldehyde	S20-Jn18210	NCP	%	95			70-130	Pass	
Endrin ketone	S20-Jn18210	NCP	%	107			70-130	Pass	
g-BHC (Lindane)	S20-Jn18210	NCP	%	106			70-130	Pass	
Heptachlor	S20-Jn18210	NCP	%	109			70-130	Pass	
Heptachlor epoxide	S20-Jn18210	NCP	%	110			70-130	Pass	
Hexachlorobenzene	S20-Jn18210	NCP	%	105			70-130	Pass	
Methoxychlor	S20-Jn18210	NCP	%	108			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	S20-Jn18159	NCP	%	111			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-Jn22527	NCP	mg/kg	2.7	2.4	11	30%	Pass	
Cadmium	S20-Jn22527	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-Jn22527	NCP	mg/kg	11	10	6.0	30%	Pass	
Copper	S20-Jn22527	NCP	mg/kg	7.2	9.2	24	30%	Pass	
Lead	S20-Jn22527	NCP	mg/kg	15	13	14	30%	Pass	
Mercury	S20-Jn22527	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-Jn22527	NCP	mg/kg	10	15	39	30%	Fail	Q15
Zinc	S20-Jn22527	NCP	mg/kg	27	28	2.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S20-Jn22879	NCP	%	21	20	3.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S20-Jn23441	CP	mg/kg	< 20	< 20	<1	30%	Pass	

Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S20-Jn23441	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S20-Jn23441	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S20-Jn23441	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S20-Jn23441	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S20-Jn23441	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S20-Jn23441	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S20-Jn23441	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S20-Jn23441	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S20-Jn23443	CP	mg/kg	22	28	26	30%	Pass	
TRH C15-C28	S20-Jn23443	CP	mg/kg	460	620	31	30%	Fail	Q15
TRH C29-C36	S20-Jn23443	CP	mg/kg	510	670	26	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S20-Jn23443	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S20-Jn23443	CP	mg/kg	880	1200	29	30%	Pass	
TRH >C34-C40	S20-Jn23443	CP	mg/kg	380	460	20	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S20-Jn23443	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S20-Jn23453	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S20-Jn23453	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S20-Jn23453	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S20-Jn23453	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S20-Jn23453	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S20-Jn23453	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Benzo(a)pyrene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S20-Jn23453	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S20-Jn24628	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S20-Jn24628	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluoroheptanesulfonic acid (PFHpS)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	S20-Jn24628	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S20-Jn24628	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S20-Jn26965	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S20-Jn26965	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S20-Jn26965	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S20-Jn26965	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S20-Jn26965	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1221	S20-Jn26965	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S20-Jn26965	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S20-Jn26965	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S20-Jn26965	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S20-Jn26965	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S20-Jn26965	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).
Q02	The duplicate %RPD is outside the recommended acceptance criteria. Further analysis indicates sample heterogeneity as the cause
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Andrew Black	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)
Sarah McCallion	Senior Analyst-PFAS (QLD)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

To:	Andrew Black
Subject:	RE: 1 DAY TAT ADDITIONAL: FW: Eurofins Test Results, Invoice - Report 725536 : Site 12520831

From: Andrew Brajlih <Andrew.Brajlih@ghd.com>
Sent: Friday, 3 July 2020 9:03 AM
To: Andrew Black <AndrewBlack@eurofins.com>
Cc: Joanna Sylvester <Joanna.Sylvester@ghd.com>
Subject: RE: Eurofins Test Results, Invoice - Report 725536 : Site 12520831

EXTERNAL EMAIL*

Hi Andrew, may I please request additional analysis under this job (12520831). I am looking to get sample TP204_0.2-0.3 analysed for asbestos. I am looking to get this on 24hr TAT if possible
Thanks for your help
Regards

Andrew Brajlih
B.Env. Sci. & Mgmt / M. Env. & Bus. Mgmt
Environmental Scientist
Licensed Asbestos Assessor (LAA001399)

GHD
Proudly employee owned
T: +61 2 4979 9088 | M: 0421 730 848 | E: andrew.brajlih@ghd.com
Level 3 GHD Tower 24 Honeysuckle Drive Newcastle NSW 2300 Australia | www.ghd.com

Connect

WATER | ENERGY & RESOURCES | ENVIRONMENT | PROPERTY& BUILDINGS | TRANSPORTATION

eurofins | Environment Testing

Melbourne
6 Monterey Road
Dandenong South Vic 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name: **GHD Pty Ltd NEWCASTLE**

Contact name: Andrew Brajlih
Project name: ADDITIONAL
Project ID: 12520831
COC number: Not provided
Turn around time: 1 Day
Date/Time received: Jul 3, 2020 9:05 AM
Eurofins reference: **729539**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins Sample Receipt : 20.2 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Andrew Black on Phone : (+61) 2 9900 8490 or by e.mail: AndrewBlack@eurofins.com

Results will be delivered electronically via e.mail to Andrew Brajlih - Andrew.Brajlih@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd NEWCASTLE email address.

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

GHD Pty Ltd
3/24 Honeysuckle Dve
Newcastle
NSW 2300

Attention:	Andrew Brajlih
Report	729539-AID
Project Name	ADDITIONAL
Project ID	12520831
Received Date	Jul 03, 2020
Date Reported	Jul 06, 2020

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name	ADDITIONAL
Project ID	12520831
Date Sampled	Jun 10, 2020
Report	729539-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP204_0.2-0.3	20-Jl05239	Jun 10, 2020	Approximate Sample 74g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jul 03, 2020	Indefinite

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Project Name: ADDITIONAL
Project ID: 12520831

Order No.: 12520831
Report #: 729539
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Jul 3, 2020 9:05 AM
Due: Jul 6, 2020
Priority: 1 Day
Contact Name: Andrew Brajlih

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	TP204_0.2-0.3	Jun 10, 2020		Soil	S20-Jl05239	X
Test Counts						1

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

The sample received was not collected in an approved asbestos bag and was therefore sub-sampled from the 250mL glass jar. Valid sub-sampling procedures were applied so as to ensure that the sub-sample to be analysed accurately represented the sample received.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Chamath JHM Annakkage	Senior Analyst-Asbestos (NSW)

Authorised by:

Laxman Dias	Senior Analyst-Asbestos (NSW)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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☐ **Sydney**	☐ **Brisbane**	☐ **Melbourne**
Unit F3 - 6 Building F, 16 Mars Road, Lane Cove	Unit 1-21 Smallwood Place, Murrarie	2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +612 9900 8400	Phone: +617 3902 4600	Phone: +613 8564 5000 Fax: +613 8564 5090
Email: enviro.syd@mgtlabmark.com.au	Email: enviro.bris@mgtlabmark.com.au	Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Page ______ of ______

Company Name :	GHD	**Contact Name:**	Alison Monkley	**Purchase Order :**	2219573	**COC Number :**	
Office Address :	24 Honeysuckle Drive Newcastle 2300	**Project Manager :**	Alison Monkley	**PROJECT Number :**	2219573	**Eurofins | mgt quote ID :**	141113GHDN
		Email for results :	Alison Monkley / Andrew Brajlih	**PROJECT Name :**	Belmont Desal Design & EA	**Data output format:**	

Special Directions & Comments :

Please analyse the following as composite sample for Suite B13

COMP 1- BH401_0.2-0.3, BH402_0.2-0.3, BH403_0.2-0.3

COMP 2- BH410_0.2-0.3, BH411_0.2-0.3, BH412_0.2-0.3

COMP3 - BH404_0.5-0.6, BH405_0.5-0.6, BH406_0.5-0.6

COMP4 - BH407_0.2-0.3 BH408_0.2-0.3 BH409_0.2-0.3

Eurofins | mgt DI water batch number:

Some common holding times (with correct preservation).
For further information contact the lab

Waters		**Soils**	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Analytes / **Containers:**

	Sample ID	**Date**	**Matrix**	TRH/BTEXN/PAH	Heavy metals (As, Cd, Cr,Cu, Ni, Pb, Zn, Hg	Asbestos	Suite B13 (OCPs / PCBs)	1000P	500P	250P	60P	1000A	500A	125A	40Vial	**Sample comments:**
1	BH401_0.2-0.3	8/09/2020	S	X	X	X	1									1. composite samples and analysed for OCP/PCB
2	BH401_0.5-0.6	8/09/2020	S		X											
3	FD01	8/09/2020	S													2. comp samples and analyse for OCP/PCB
4	BH401_1.0-1.1	8/09/2020	S													
5	BH402_0.2-0.3	8/09/2020	S	X	X	X	1									
6	BH402_0.5-0.6	8/09/2020	S		X		4									4. comp samples and analyse for OCP/PCB
7	BH402_1.0-1.1	8/09/2020	S													
8	BH403_0.2-0.3	8/09/2020	S		X	X	1									
9	BH403_0.5-0.6	8/09/2020	S		X											
10	BH403_1.0-1.1	8/09/2020	S													
11	BH404_0.2-0.3	8/09/2020	S	X	X	X	1									
12	BH404_0.5-0.6	8/09/2020	S		X											
13	BH404_1.0-1.1	8/09/2020	S													
14	BH405_0.2-0.3	8/09/2020	S		X	X	2									
15	FD02	8/09/2020	S													
16	BH405_0.5-0.6	8/09/2020	S													
17	BH405_0.7-0.8	8/09/2020	S		X		4									
18	BH406_0.2-0.3	8/09/2020	S	X	X	X	2									
19	FD03	8/09/2020	S	X	X											

	Laboratory Staff	**Turn around time**	**Method Of Shipment**	**Temperature on arrival:**
Relinquished By: A Brajlih	**Received By:** Suzanne Ford	1 DAY ☐ 2 DAY ☐ 3 DAY ☐	☐ Courier ☐ Hand Delivered ☐ Postal	17·06 °C
Date & Time::	**Date & Time:** 10/9/2020 1:41PM	5 DAY ☑ 10 DAY ☐ Other:	Courier Consignment # :	**Report number:** 74366
Signature:	**Signature:**			

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☐ **Sydney**
Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
Phone: +612 9900 8400
Email: enviro.syd@mgtlabmark.com.au

☐ **Brisbane**
Unit 1-21 Smallwood Place, Murrarie
Phone: +617 3902 4600
Email: enviro.bris@mgtlabmark.com.au

☐ **Melbourne**
2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 8564 5000 Fax: +613 8564 5090
Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Page ______ of ______

Company Name :	GHD	**Contact Name:**	Alison Monkley	**Purchase Order :**	2219573	**COC Number :**	
Office Address :	24 Honeysuckle Drive Newcastle 2300	**Project Manager :**	Alison Monkley	**PROJECT Number :**	2219573	**Eurofins | mgt quote ID :**	141113GHDN
		Email for results :	Alison Monkley / Andrew Brajlih	**PROJECT Name :**	Belmont Desal Design & EA	**Data output format:**	

Special Directions & Comments :

Please analyse the following as composite sample for Suite B13

Eurofins | mgt DI water batch number:

Some common holding times (with correct preservation).
For further information contact the lab

Waters		**Soils**	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

	Sample ID	Date	Matrix	TRH/BTEXN/PAH	Heavy metals (As, Cd, Cr,Cu, Ni, Pb, Zn, Hg	Asbestos	Suite B13 (OCPs / PCBs)	1000P	500P	250P	60P	1000A	500A	125A	40Vial	Sample comments:
1	BH406_0.5-0.6	8/09/2020	S		X											
2	BH406_1.0-1.1	8/09/2020	S													
3	BH407_0.2-0.3	9/09/2020	S	X	X	X	2									2. comp samples and analyse for OCP/PCB
4	FD04	9/09/2020	S		X											
5	BH407_0.5-0.6	9/09/2020	S	X												
6	BH407_1.0-1.1	9/09/2020	S		X											3. comp samples and analyse for OCP/PCB
7	BH408_0.2-0.3	9/09/2020	S		X	X	2									
8	BH408_0.5-0.6	9/09/2020	S		X											
9	BH408_1.0-1.1	9/09/2020	S													4. Comp and analyse for OCP/PCB
10	BH409_0.2-0.3	9/09/2020	S		X	X	3									
11	BH409_0.5-0.6	9/09/2020	S				4									
12	BH409_1.0-1.1	9/09/2020	S		X											
13	BH410_0.2-0.3	9/09/2020	S	X	X	X	3									
14	BH410_0.5-0.6	9/09/2020	S		X											
15	BH410_1.0-1.1	9/09/2020	S													
16	BH411_0.2-0.3	9/09/2020	S		X	X	3									
17	BH411_0.5-0.6	9/09/2020	S		X											
18	BH411_1.0-1.1	9/09/2020	S													
19	BH412_0.2-0.3	9/09/2020	S	X	X	X	3									

Relinquished By: A.Brajlih

Date & Time:: 44083

Signature:

Laboratory Staff

Received By: Suzanne Ford

Date & Time: 10/9/2020 1:41PM

Signature:

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐
5 DAY ☑ 10 DAY ☐ Other:

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival: 17.06°C

Report number: 743366

QS3009_R0 Issue Date: 25 February 2013 Page 1 of 1

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☐ **Sydney**
Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
Phone: +612 9900 8400
Email: enviro.syd@mgtlabmark.com.au

☐ **Brisbane**
Unit 1-21 Smallwood Place, Murrarie
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Email: enviro.bris@mgtlabmark.com.au

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Phone: +613 8564 5000 Fax: +613 8564 5090
Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Page ______ of ______

Company Name : GHD
Office Address : 24 Honeysuckle Drive
Newcastle 2300

Contact Name: Alison Monkley
Project Manager : Alison Monkley
Email for results : Alison Monkley / Andrew Brajlih

Purchase Order : 2219573
PROJECT Number : 2219573
PROJECT Name : Belmont Desal Design & EA

COC Number :
Eurofins | mgt quote ID : 141113GHDN
Data output format:

Special Directions & Comments :
Please analyse the following as composite sample for Suite B13

Eurofins | mgt DI water batch number:

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

				Analytes																						Containers:								Sample comments:
	Sample ID	Date	Matrix	TRH/BTEXN/PAH	Heavy metals (As, Cd, Cr,Cu, Ni, Pb, Zn, Hg	Asbestos	Suite B13 (OCPs / PCBs)																			1000P	500P	250P	60P	1000A	500A	125A	40Vial	
1	BH412_0.5-0.6	9/09/2020	S		X		4																											
2	BH412_1.0-1.1	9/09/2020	S																															4. Comp and analyse for OCP/PCB
3																																		
4																																		
5																																		
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18																																		
19																																		

Relinquished By:
Date & Time::
Signature:

Laboratory Staff
Received By: Suzanne Fong
Date & Time: 10/9/2020 1:41PM
Signature:

Turn around time
1 DAY ☐ 2 DAY ☐ 3 DAY ☐
5 DAY ☑ 10 DAY ☐ Other:

Method Of Shipment
☐ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival: 17.06°C
Report number: 743366

QS3009_R0 Issue Date: 25 February 2013 Page 1 of 1

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ABN: 50 005 085 521 www.eurofins.com.au EnviroSales@eurofins.com

Australia **New Zealand**

Melbourne	**Sydney**	**Brisbane**	**Perth**	**Newcastle**	**Auckland**	**Christchurch**
6 Monterey Road Dandenong South VIC 3175 Phone : +61 3 8564 5000 NATA # 1261 Site # 1254 & 14271	Unit F3, Building F 16 Mars Road Lane Cove West NSW 2066 Phone : +61 2 9900 8400 NATA # 1261 Site # 18217	1/21 Smallwood Place Murarrie QLD 4172 Phone : +61 7 3902 4600 NATA # 1261 Site # 20794	2/91 Leach Highway Kewdale WA 6105 Phone : +61 8 9251 9600 NATA # 1261 Site # 23736	4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448	35 O'Rorke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327	43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450 IANZ # 1290

Sample Receipt Advice

Company name:	GHD Pty Ltd NEWCASTLE
Contact name:	Alison Monkley
Project name:	BELMONT DESAL DESIGN & EA
Project ID:	2219573
Turnaround time:	5 Day
Date/Time received	Sep 10, 2020 1:41 PM
Eurofins reference	743366

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	Sample Temperature of a random sample selected from the batch as recorded by Eurofins Sample Receipt : 17.1 degrees Celsius.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Andrew Black on phone : (+61) 2 9900 8490 or by email: AndrewBlack@eurofins.com

Results will be delivered electronically via email to Alison Monkley - alison.monkley@ghd.com.au.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd NEWCASTLE email address.

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

GHD Pty Ltd
3/24 Honeysuckle Dve
Newcastle
NSW 2300

Attention:	Alison Monkley
Report	743366-AID
Project Name	BELMONT DESAL DESIGN & EA
Project ID	2219573
Received Date	Sep 10, 2020
Date Reported	Sep 17, 2020

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name BELMONT DESAL DESIGN & EA
Project ID 2219573
Date Sampled Sep 08, 2020 to Sep 09, 2020
Report 743366-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH401_0.2-0.3	20-Se18646	Sep 08, 2020	Approximate Sample 116g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH402_0.2-0.3	20-Se18648	Sep 08, 2020	Approximate Sample 421g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH403_0.2-0.3	20-Se18650	Sep 08, 2020	Approximate Sample 95g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH404_0.2-0.3	20-Se18652	Sep 08, 2020	Approximate Sample 256g Sample consisted of: Brown fine-grained sandy soil, rocks and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH405_0.2-0.3	20-Se18654	Sep 08, 2020	Approximate Sample 510g Sample consisted of: Brown fine-grained sandy soil, rocks and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH406_0.2-0.3	20-Se18656	Sep 08, 2020	Approximate Sample 264g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH407_0.2-0.3	20-Se18659	Sep 09, 2020	Approximate Sample 284g Sample consisted of: Brown coarse-grained soil, brick, cement, rocks and debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH408_0.2-0.3	20-Se18663	Sep 09, 2020	Approximate Sample 242g Sample consisted of: Brown fine-grained sandy soil, rocks and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH409_0.2-0.3	20-Se18665	Sep 09, 2020	Approximate Sample 260g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH410_0.2-0.3	20-Se18667	Sep 09, 2020	Approximate Sample 283g Sample consisted of: Brown fine-grained sandy soil, rocks and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH411_0.2-0.3	20-Se18669	Sep 09, 2020	Approximate Sample 263g Sample consisted of: Brown fine-grained sandy soil, rocks and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH412_0.2-0.3	20-Se18671	Sep 09, 2020	Approximate Sample 325g Sample consisted of: Brown fine-grained sandy soil, rocks and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Sep 10, 2020	Indefinite

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Project Name: BELMONT DESAL DESIGN & EA
Project ID: 2219573

Order No.: 2219573
Report #: 743366
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Sep 10, 2020 1:41 PM
Due: Sep 17, 2020
Priority: 5 Day
Contact Name: Alison Monkley

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Metals M8	Suite B13: OCP/PCB	Moisture Set	Eurofins Suite B7	Eurofins Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
Newcastle Laboratory												
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	BH401_0.2-0.3	Sep 08, 2020		Soil	S20-Se18646	X				X	X	
2	BH401_0.5-0.6	Sep 08, 2020		Soil	S20-Se18647			X		X		
3	BH402_0.2-0.3	Sep 08, 2020		Soil	S20-Se18648	X				X	X	
4	BH402_0.5-0.6	Sep 08, 2020		Soil	S20-Se18649			X		X		
5	BH403_0.2-0.3	Sep 08, 2020		Soil	S20-Se18650	X		X		X		
6	BH403_0.5-0.6	Sep 08, 2020		Soil	S20-Se18651			X		X		
7	BH404_0.2-0.3	Sep 08, 2020		Soil	S20-Se18652	X				X	X	
8	BH404_0.5-0.6	Sep 08, 2020		Soil	S20-Se18653			X		X		
9	BH405_0.2-0.3	Sep 08, 2020		Soil	S20-Se18654	X		X		X		

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Project Name: BELMONT DESAL DESIGN & EA
Project ID: 2219573

Order No.: 2219573
Report #: 743366
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Sep 10, 2020 1:41 PM
Due: Sep 17, 2020
Priority: 5 Day
Contact Name: Alison Monkley

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Metals M8	Suite B13: OCP/PCB	Moisture Set	Eurofins Suite B7	Eurofins Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
10	BH405_0.7-0.8	Sep 08, 2020		Soil	S20-Se18655			X		X		
11	BH406_0.2-0.3	Sep 08, 2020		Soil	S20-Se18656	X				X	X	
12	FD03	Sep 08, 2020		Soil	S20-Se18657					X	X	
13	BH406_0.5-0.6	Sep 08, 2020		Soil	S20-Se18658			X		X		
14	BH407_0.2-0.3	Sep 09, 2020		Soil	S20-Se18659	X				X	X	
15	FD04	Sep 09, 2020		Soil	S20-Se18660			X		X		
16	BH407_0.5-0.6	Sep 09, 2020		Soil	S20-Se18661					X		X
17	BH407_1.0-1.1	Sep 09, 2020		Soil	S20-Se18662			X		X		
18	BH408_0.2-0.3	Sep 09, 2020		Soil	S20-Se18663	X		X		X		
19	BH408_0.5-0.6	Sep 09, 2020		Soil	S20-Se18664			X		X		
20	BH409_0.2-0.3	Sep 09, 2020		Soil	S20-Se18665	X		X		X		
21	BH409_1.0-1.1	Sep 09, 2020		Soil	S20-Se18666			X		X		
22	BH410_0.2-0.3	Sep 09, 2020		Soil	S20-Se18667	X				X	X	

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Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Metals M8	Suite B13: OCP/PCB	Moisture Set	Eurofins Suite B7	Eurofins Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
23	BH410_0.5-0.6	Sep 09, 2020		Soil	S20-Se18668			X		X		
24	BH411_0.2-0.3	Sep 09, 2020		Soil	S20-Se18669	X		X		X		
25	BH411_0.5-0.6	Sep 09, 2020		Soil	S20-Se18670			X		X		
26	BH412_0.2-0.3	Sep 09, 2020		Soil	S20-Se18671	X				X	X	
27	FD01	Sep 08, 2020		Soil	S20-Se18901		X					
28	BH401_1.0-1.1	Sep 08, 2020		Soil	S20-Se18902		X					
29	BH402_1.0-1.1	Sep 08, 2020		Soil	S20-Se18903		X					
30	BH403_1.0-1.1	Sep 08, 2020		Soil	S20-Se18904		X					
31	BH404_1.0-1.1	Sep 08, 2020		Soil	S20-Se18905		X					
32	FD02	Sep 08, 2020		Soil	S20-Se18906		X					
33	BH405_0.5-0.6	Sep 08, 2020		Soil	S20-Se18907		X					
34	BH406_1.0-1.1	Sep 08, 2020		Soil	S20-Se18908		X					
35	BH408_1.0-1.1	Sep 09, 2020		Soil	S20-Se18909		X					

Company Name: GHD Pty Ltd NEWCASTLE
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Received: Sep 10, 2020 1:41 PM
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Contact Name: Alison Monkley

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Metals M8	Suite B13: OCP/PCB	Moisture Set	Eurofins Suite B7	Eurofins Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
36	BH410_1.0-1.1	Sep 09, 2020		Soil	S20-Se18910		X					
37	BH411_1.0-1.1	Sep 09, 2020		Soil	S20-Se18911		X					
38	BH412_1.0-1.1	Sep 09, 2020		Soil	S20-Se18912		X					
39	BH412_0.5-0.6	Sep 09, 2020		Soil	S20-Se19300			X		X		
40	COMPOSITE 1	Sep 09, 2020		Soil	S20-Se21964				X	X		
41	COMPOSITE 2	Sep 09, 2020		Soil	S20-Se21965				X	X		
42	COMPOSITE 3	Sep 09, 2020		Soil	S20-Se21966				X	X		
43	COMPOSITE 4	Sep 09, 2020		Soil	S20-Se21967				X	X		
Test Counts						12	12	18	4	31	8	1

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Chamath JHM Annakkage	Senior Analyst-Asbestos (NSW)

Authorised by:

Laxman Dias	Senior Analyst-Asbestos (NSW)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

GHD Pty Ltd
3/24 Honeysuckle Dve
Newcastle
NSW 2300

Attention: **Alison Monkley**

Report **743366-S**
Project name BELMONT DESAL DESIGN & EA
Project ID 2219573
Received Date Sep 10, 2020

Client Sample ID			BH401_0.2-0.3	BH401_0.5-0.6	BH402_0.2-0.3	BH402_0.5-0.6
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Se18646**	**S20-Se18647**	**S20-Se18648**	**S20-Se18649**
Date Sampled			Sep 08, 2020	Sep 08, 2020	Sep 08, 2020	Sep 08, 2020
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	-
Xylenes - Total*	0.3	mg/kg	< 0.3	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	66	-	83	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	< 0.5	-
TRH C6-C10	20	mg/kg	< 20	-	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	< 20	-
TRH >C10-C16	50	mg/kg	< 50	-	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	< 50	-
TRH >C16-C34	100	mg/kg	< 100	-	< 100	-
TRH >C34-C40	100	mg/kg	< 100	-	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	-	< 100	-
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	-	< 20	-
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C10-C14	20	mg/kg	< 20	-	< 20	-
TRH C15-C28	50	mg/kg	< 50	-	< 50	-
TRH C29-C36	50	mg/kg	< 50	-	< 50	-
TRH C10-C36 (Total)	50	mg/kg	< 50	-	< 50	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	BH401_0.2-0.3 Soil S20-Se18646 Sep 08, 2020	BH401_0.5-0.6 Soil S20-Se18647 Sep 08, 2020	BH402_0.2-0.3 Soil S20-Se18648 Sep 08, 2020	BH402_0.5-0.6 Soil S20-Se18649 Sep 08, 2020
Polycyclic Aromatic Hydrocarbons						
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PAH*	0.5	mg/kg	< 0.5	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	93	-	108	-
p-Terphenyl-d14 (surr.)	1	%	90	-	107	-
Heavy Metals						
Arsenic	2	mg/kg	< 2	2.7	4.2	4.6
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	< 5	140	9.4
Copper	5	mg/kg	< 5	< 5	8.3	6.9
Lead	5	mg/kg	< 5	< 5	10.0	12
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	6.0	< 5
Zinc	5	mg/kg	8.5	5.7	38	44
% Moisture	1	%	2.1	2.1	3.5	4.0

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled Test/Reference	LOR	Unit	BH403_0.2-0.3 Soil S20-Se18650 Sep 08, 2020	BH403_0.5-0.6 Soil S20-Se18651 Sep 08, 2020	BH404_0.2-0.3 Soil S20-Se18652 Sep 08, 2020	BH404_0.5-0.6 Soil S20-Se18653 Sep 08, 2020
BTEX						
Benzene	0.1	mg/kg	-	-	< 0.1	-
Toluene	0.1	mg/kg	-	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	-	-	1.2	-
o-Xylene	0.1	mg/kg	-	-	0.7	-
Xylenes - Total*	0.3	mg/kg	-	-	1.9	-
4-Bromofluorobenzene (surr.)	1	%	-	-	83	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	-	-	< 0.5	-
TRH C6-C10	20	mg/kg	-	-	< 20	-
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	-	-	< 20	-
TRH >C10-C16	50	mg/kg	-	-	< 50	-
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	-	-	< 50	-
TRH >C16-C34	100	mg/kg	-	-	< 100	-
TRH >C34-C40	100	mg/kg	-	-	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	-	-	< 100	-
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	-	< 20	-

Client Sample ID			BH403_0.2-0.3	BH403_0.5-0.6	BH404_0.2-0.3	BH404_0.5-0.6
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Se18650**	**S20-Se18651**	**S20-Se18652**	**S20-Se18653**
Date Sampled			Sep 08, 2020	Sep 08, 2020	Sep 08, 2020	Sep 08, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C10-C14	20	mg/kg	-	-	< 20	-
TRH C15-C28	50	mg/kg	-	-	< 50	-
TRH C29-C36	50	mg/kg	-	-	< 50	-
TRH C10-C36 (Total)	50	mg/kg	-	-	< 50	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	1.2	-
Acenaphthene	0.5	mg/kg	-	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	-	-	< 0.5	-
Anthracene	0.5	mg/kg	-	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	-	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	-	-	< 0.5	-
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	-	-	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	-	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	-	-	< 0.5	-
Chrysene	0.5	mg/kg	-	-	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	-	-	< 0.5	-
Fluoranthene	0.5	mg/kg	-	-	< 0.5	-
Fluorene	0.5	mg/kg	-	-	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	-	< 0.5	-
Naphthalene	0.5	mg/kg	-	-	< 0.5	-
Phenanthrene	0.5	mg/kg	-	-	< 0.5	-
Pyrene	0.5	mg/kg	-	-	< 0.5	-
Total PAH*	0.5	mg/kg	-	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	-	-	94	-
p-Terphenyl-d14 (surr.)	1	%	-	-	91	-
Heavy Metals						
Arsenic	2	mg/kg	2.6	2.1	4.2	3.7
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	< 5	6.2	6.6
Copper	5	mg/kg	11	9.2	22	24
Lead	5	mg/kg	13	7.3	21	10
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.1
Nickel	5	mg/kg	< 5	< 5	5.1	< 5
Zinc	5	mg/kg	87	33	130	67
% Moisture	1	%	6.6	3.4	10	10.0

Client Sample ID			**BH405_0.2-0.3**	**BH405_0.7-0.8**	**BH406_0.2-0.3**	**FD03**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Se18654**	**S20-Se18655**	**S20-Se18656**	**S20-Se18657**
Date Sampled			**Sep 08, 2020**	**Sep 08, 2020**	**Sep 08, 2020**	**Sep 08, 2020**
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	-	-	< 0.1	< 0.1
Toluene	0.1	mg/kg	-	-	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	-	-	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	-	-	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	-	92	85
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	-	-	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	-	-	< 20	< 20
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	-	-	< 20	< 20
TRH >C10-C16	50	mg/kg	-	-	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	-	-	< 50	< 50
TRH >C16-C34	100	mg/kg	-	-	< 100	< 100
TRH >C34-C40	100	mg/kg	-	-	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	-	< 100	< 100
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	-	< 20	< 20
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C10-C14	20	mg/kg	-	-	< 20	< 20
TRH C15-C28	50	mg/kg	-	-	61	< 50
TRH C29-C36	50	mg/kg	-	-	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	-	-	61	< 50
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	1.2	1.2
Acenaphthene	0.5	mg/kg	-	-	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	-	-	< 0.5	< 0.5
Anthracene	0.5	mg/kg	-	-	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	-	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	-	< 0.5	< 0.5
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	-	-	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	-	-	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	-	< 0.5	< 0.5
Chrysene	0.5	mg/kg	-	-	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	-	-	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	-	-	< 0.5	< 0.5
Fluorene	0.5	mg/kg	-	-	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	-	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	-	-	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	-	-	< 0.5	< 0.5
Pyrene	0.5	mg/kg	-	-	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	-	-	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	-	99	94
p-Terphenyl-d14 (surr.)	1	%	-	-	99	94

Client Sample ID			BH405_0.2-0.3	BH405_0.7-0.8	BH406_0.2-0.3	FD03
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Se18654**	**S20-Se18655**	**S20-Se18656**	**S20-Se18657**
Date Sampled			Sep 08, 2020	Sep 08, 2020	Sep 08, 2020	Sep 08, 2020
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	2.8	4.4	3.5	3.4
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	11	11	6.2	6.2
Copper	5	mg/kg	22	25	17	16
Lead	5	mg/kg	10	11	12	13
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	6.7	8.0	< 5	< 5
Zinc	5	mg/kg	83	89	110	110
% Moisture	1	%	5.3	5.6	3.8	3.6

Client Sample ID			BH406_0.5-0.6	BH407_0.2-0.3	FD04	BH407_0.5-0.6
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Se18658**	**S20-Se18659**	**S20-Se18660**	**S20-Se18661**
Date Sampled			Sep 08, 2020	Sep 09, 2020	Sep 09, 2020	Sep 09, 2020
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	0.3	-	< 0.2
o-Xylene	0.1	mg/kg	-	0.1	-	< 0.1
Xylenes - Total*	0.3	mg/kg	-	0.4	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	93	-	64
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	-	< 0.5	-	< 0.5
TRH C6-C10	20	mg/kg	-	< 20	-	< 20
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	-	< 20	-	< 20
TRH >C10-C16	50	mg/kg	-	< 50	-	51
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	-	< 50	-	51
TRH >C16-C34	100	mg/kg	-	160	-	300
TRH >C34-C40	100	mg/kg	-	< 100	-	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	160	-	351
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	< 20	-	< 20
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C10-C14	20	mg/kg	-	21	-	35
TRH C15-C28	50	mg/kg	-	120	-	240
TRH C29-C36	50	mg/kg	-	70	-	110
TRH C10-C36 (Total)	50	mg/kg	-	211	-	385
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	-	1.2
Acenaphthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5

Client Sample ID **Sample Matrix** **Eurofins Sample No.** **Date Sampled** Test/Reference	LOR	Unit	BH406_0.5-0.6 Soil S20-Se18658 Sep 08, 2020	BH407_0.2-0.3 Soil S20-Se18659 Sep 09, 2020	FD04 Soil S20-Se18660 Sep 09, 2020	BH407_0.5-0.6 Soil S20-Se18661 Sep 09, 2020
Polycyclic Aromatic Hydrocarbons						
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Chrysene	0.5	mg/kg	-	< 0.5	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Fluoranthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Fluorene	0.5	mg/kg	-	< 0.5	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Naphthalene	0.5	mg/kg	-	< 0.5	-	< 0.5
Phenanthrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Total PAH*	0.5	mg/kg	-	< 0.5	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	94	-	95
p-Terphenyl-d14 (surr.)	1	%	-	94	-	94
Heavy Metals						
Arsenic	2	mg/kg	12	5.8	5.7	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	-
Chromium	5	mg/kg	< 5	8.3	13	-
Copper	5	mg/kg	19	18	20	-
Lead	5	mg/kg	13	14	15	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Nickel	5	mg/kg	< 5	5.8	8.5	-
Zinc	5	mg/kg	160	91	110	-
% Moisture	1	%	3.4	6.7	7.3	7.9

Client Sample ID **Sample Matrix** **Eurofins Sample No.** **Date Sampled** Test/Reference	LOR	Unit	BH407_1.0-1.1 Soil S20-Se18662 Sep 09, 2020	BH408_0.2-0.3 Soil S20-Se18663 Sep 09, 2020	BH408_0.5-0.6 Soil S20-Se18664 Sep 09, 2020	BH409_0.2-0.3 Soil S20-Se18665 Sep 09, 2020
Heavy Metals						
Arsenic	2	mg/kg	2.7	2.1	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	< 5	< 5	< 5
Copper	5	mg/kg	< 5	34	8.9	< 5
Lead	5	mg/kg	< 5	24	< 5	< 5
Mercury	0.1	mg/kg	< 0.1	0.2	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	7.8	200	36	16
% Moisture	1	%	3.0	2.1	< 1	1.7

Client Sample ID			BH409_1.0-1.1	BH410_0.2-0.3	BH410_0.5-0.6	BH411_0.2-0.3
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Se18666**	**S20-Se18667**	**S20-Se18668**	**S20-Se18669**
Date Sampled			Sep 09, 2020	Sep 09, 2020	Sep 09, 2020	Sep 09, 2020
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	-
Toluene	0.1	mg/kg	-	< 0.1	-	-
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	-
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	-
o-Xylene	0.1	mg/kg	-	< 0.1	-	-
Xylenes - Total*	0.3	mg/kg	-	< 0.3	-	-
4-Bromofluorobenzene (surr.)	1	%	-	53	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	-	< 0.5	-	-
TRH C6-C10	20	mg/kg	-	< 20	-	-
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	-	< 20	-	-
TRH >C10-C16	50	mg/kg	-	< 50	-	-
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	-	< 50	-	-
TRH >C16-C34	100	mg/kg	-	110	-	-
TRH >C34-C40	100	mg/kg	-	< 100	-	-
TRH >C10-C40 (total)*	100	mg/kg	-	110	-	-
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	< 20	-	-
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C10-C14	20	mg/kg	-	< 20	-	-
TRH C15-C28	50	mg/kg	-	85	-	-
TRH C29-C36	50	mg/kg	-	< 50	-	-
TRH C10-C36 (Total)	50	mg/kg	-	85	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	-	-
Acenaphthene	0.5	mg/kg	-	< 0.5	-	-
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	-
Anthracene	0.5	mg/kg	-	< 0.5	-	-
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	-
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	-
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	-	< 0.5	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	-	-
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	-
Chrysene	0.5	mg/kg	-	< 0.5	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	-	-
Fluoranthene	0.5	mg/kg	-	< 0.5	-	-
Fluorene	0.5	mg/kg	-	< 0.5	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	-
Naphthalene	0.5	mg/kg	-	< 0.5	-	-
Phenanthrene	0.5	mg/kg	-	< 0.5	-	-
Pyrene	0.5	mg/kg	-	< 0.5	-	-
Total PAH*	0.5	mg/kg	-	< 0.5	-	-
2-Fluorobiphenyl (surr.)	1	%	-	96	-	-
p-Terphenyl-d14 (surr.)	1	%	-	96	-	-

Client Sample ID			BH409_1.0-1.1	BH410_0.2-0.3	BH410_0.5-0.6	BH411_0.2-0.3
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Se18666**	**S20-Se18667**	**S20-Se18668**	**S20-Se18669**
Date Sampled			**Sep 09, 2020**	**Sep 09, 2020**	**Sep 09, 2020**	**Sep 09, 2020**
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	< 2	4.3	2.3	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	5.9	< 5	< 5
Copper	5	mg/kg	< 5	15	< 5	6.3
Lead	5	mg/kg	< 5	8.2	< 5	< 5
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	7.8	< 5	< 5
Zinc	5	mg/kg	< 5	56	12	24
% Moisture	1	%	3.3	5.0	2.1	3.4

Client Sample ID			BH411_0.5-0.6	BH412_0.2-0.3	BH412_0.5-0.6	COMPOSITE 1
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Se18670**	**S20-Se18671**	**S20-Se19300**	**S20-Se21964**
Date Sampled			**Sep 09, 2020**	**Sep 09, 2020**	**Sep 09, 2020**	**Sep 09, 2020**
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	-
Toluene	0.1	mg/kg	-	< 0.1	-	-
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	-
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	-
o-Xylene	0.1	mg/kg	-	< 0.1	-	-
Xylenes - Total*	0.3	mg/kg	-	< 0.3	-	-
4-Bromofluorobenzene (surr.)	1	%	-	54	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	-	< 0.5	-	-
TRH C6-C10	20	mg/kg	-	< 20	-	-
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	-	< 20	-	-
TRH >C10-C16	50	mg/kg	-	< 50	-	-
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	-	< 50	-	-
TRH >C16-C34	100	mg/kg	-	< 100	-	-
TRH >C34-C40	100	mg/kg	-	< 100	-	-
TRH >C10-C40 (total)*	100	mg/kg	-	< 100	-	-
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	< 20	-	-
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C10-C14	20	mg/kg	-	< 20	-	-
TRH C15-C28	50	mg/kg	-	< 50	-	-
TRH C29-C36	50	mg/kg	-	< 50	-	-
TRH C10-C36 (Total)	50	mg/kg	-	< 50	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	-	-
Acenaphthene	0.5	mg/kg	-	< 0.5	-	-
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	-
Anthracene	0.5	mg/kg	-	< 0.5	-	-

Client Sample ID **Sample Matrix** **Eurofins Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**BH411_0.5-0.6** **Soil** **S20-Se18670** **Sep 09, 2020**	**BH412_0.2-0.3** **Soil** **S20-Se18671** **Sep 09, 2020**	**BH412_0.5-0.6** **Soil** **S20-Se19300** **Sep 09, 2020**	**COMPOSITE 1** **Soil** **S20-Se21964** **Sep 09, 2020**
Polycyclic Aromatic Hydrocarbons						
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	-
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	-	-
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	-
Chrysene	0.5	mg/kg	-	< 0.5	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	-	-
Fluoranthene	0.5	mg/kg	-	< 0.5	-	-
Fluorene	0.5	mg/kg	-	< 0.5	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	-
Naphthalene	0.5	mg/kg	-	< 0.5	-	-
Phenanthrene	0.5	mg/kg	-	< 0.5	-	-
Pyrene	0.5	mg/kg	-	< 0.5	-	-
Total PAH*	0.5	mg/kg	-	< 0.5	-	-
2-Fluorobiphenyl (surr.)	1	%	-	92	-	-
p-Terphenyl-d14 (surr.)	1	%	-	92	-	-
Heavy Metals						
Arsenic	2	mg/kg	< 2	3.2	< 2	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	-
Chromium	5	mg/kg	< 5	< 5	< 5	-
Copper	5	mg/kg	< 5	11	7.0	-
Lead	5	mg/kg	< 5	8.9	11	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Nickel	5	mg/kg	< 5	< 5	< 5	-
Zinc	5	mg/kg	6.0	34	19	-
% Moisture	1	%	3.0	4.6	4.4	5.5
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-BHC	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-BHC	0.05	mg/kg	-	-	-	< 0.05
d-BHC	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.2	mg/kg	-	-	-	< 0.2
Toxaphene	1	mg/kg	-	-	-	< 1

Client Sample ID **Sample Matrix** **Eurofins Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**BH411_0.5-0.6** **Soil** **S20-Se18670** **Sep 09, 2020**	**BH412_0.2-0.3** **Soil** **S20-Se18671** **Sep 09, 2020**	**BH412_0.5-0.6** **Soil** **S20-Se19300** **Sep 09, 2020**	**COMPOSITE 1** **Soil** **S20-Se21964** **Sep 09, 2020**
Organochlorine Pesticides						
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	-	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	-	< 0.2
Dibutylchlorendate (surr.)	1	%	-	-	-	60
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	86
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1221	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1232	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1242	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1248	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1254	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1260	0.5	mg/kg	-	-	-	< 0.5
Total PCB*	0.5	mg/kg	-	-	-	< 0.5
Dibutylchlorendate (surr.)	1	%	-	-	-	60
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	86

Client Sample ID **Sample Matrix** **Eurofins Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**COMPOSITE 2** **Soil** **S20-Se21965** **Sep 09, 2020**	**COMPOSITE 3** **Soil** **S20-Se21966** **Sep 09, 2020**	**COMPOSITE 4** **Soil** **S20-Se21967** **Sep 09, 2020**
% Moisture	1	%	4.5	3.5	4.2
Organochlorine Pesticides					
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05

Client Sample ID			**COMPOSITE 2**	**COMPOSITE 3**	**COMPOSITE 4**
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Se21965**	**S20-Se21966**	**S20-Se21967**
Date Sampled			**Sep 09, 2020**	**Sep 09, 2020**	**Sep 09, 2020**
Test/Reference	LOR	Unit			
Organochlorine Pesticides					
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2
Dibutylchlorendate (surr.)	1	%	57	61	50
Tetrachloro-m-xylene (surr.)	1	%	86	91	82
Polychlorinated Biphenyls					
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	57	61	50
Tetrachloro-m-xylene (surr.)	1	%	86	91	82

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B4			
BTEX	Sydney	Sep 11, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Sep 11, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Sep 11, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons	Sydney	Sep 11, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Sep 11, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Sep 11, 2020	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Sep 11, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Sep 11, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			
Organochlorine Pesticides	Sydney	Sep 15, 2020	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Sydney	Sep 15, 2020	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			

Company Name: GHD Pty Ltd NEWCASTLE
Address: 3/24 Honeysuckle Dve
Newcastle
NSW 2300

Project Name: BELMONT DESAL DESIGN & EA
Project ID: 2219573

Order No.: 2219573
Report #: 743366
Phone: 02 4979 9999
Fax: 02 4979 9988

Received: Sep 10, 2020 1:41 PM
Due: Sep 17, 2020
Priority: 5 Day
Contact Name: Alison Monkley

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Metals M8	Suite B13: OCP/PCB	Moisture Set	Eurofins Suite B7	Eurofins Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
Newcastle Laboratory												
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	BH401_0.2-0.3	Sep 08, 2020		Soil	S20-Se18646	X				X	X	
2	BH401_0.5-0.6	Sep 08, 2020		Soil	S20-Se18647			X		X		
3	BH402_0.2-0.3	Sep 08, 2020		Soil	S20-Se18648	X				X	X	
4	BH402_0.5-0.6	Sep 08, 2020		Soil	S20-Se18649			X		X		
5	BH403_0.2-0.3	Sep 08, 2020		Soil	S20-Se18650	X		X		X		
6	BH403_0.5-0.6	Sep 08, 2020		Soil	S20-Se18651			X		X		
7	BH404_0.2-0.3	Sep 08, 2020		Soil	S20-Se18652	X				X	X	
8	BH404_0.5-0.6	Sep 08, 2020		Soil	S20-Se18653			X		X		
9	BH405_0.2-0.3	Sep 08, 2020		Soil	S20-Se18654	X		X		X		

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Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
10	BH405_0.7-0.8	Sep 08, 2020		Soil	S20-Se18655			X		X		
11	BH406_0.2-0.3	Sep 08, 2020		Soil	S20-Se18656	X				X	X	
12	FD03	Sep 08, 2020		Soil	S20-Se18657					X	X	
13	BH406_0.5-0.6	Sep 08, 2020		Soil	S20-Se18658			X		X		
14	BH407_0.2-0.3	Sep 09, 2020		Soil	S20-Se18659	X				X	X	
15	FD04	Sep 09, 2020		Soil	S20-Se18660			X		X		
16	BH407_0.5-0.6	Sep 09, 2020		Soil	S20-Se18661					X		X
17	BH407_1.0-1.1	Sep 09, 2020		Soil	S20-Se18662			X		X		
18	BH408_0.2-0.3	Sep 09, 2020		Soil	S20-Se18663	X		X		X		
19	BH408_0.5-0.6	Sep 09, 2020		Soil	S20-Se18664			X		X		
20	BH409_0.2-0.3	Sep 09, 2020		Soil	S20-Se18665	X		X		X		
21	BH409_1.0-1.1	Sep 09, 2020		Soil	S20-Se18666			X		X		
22	BH410_0.2-0.3	Sep 09, 2020		Soil	S20-Se18667	X				X	X	

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Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
23	BH410_0.5-0.6	Sep 09, 2020		Soil	S20-Se18668			X		X		
24	BH411_0.2-0.3	Sep 09, 2020		Soil	S20-Se18669	X		X		X		
25	BH411_0.5-0.6	Sep 09, 2020		Soil	S20-Se18670			X		X		
26	BH412_0.2-0.3	Sep 09, 2020		Soil	S20-Se18671	X				X	X	
27	FD01	Sep 08, 2020		Soil	S20-Se18901		X					
28	BH401_1.0-1.1	Sep 08, 2020		Soil	S20-Se18902		X					
29	BH402_1.0-1.1	Sep 08, 2020		Soil	S20-Se18903		X					
30	BH403_1.0-1.1	Sep 08, 2020		Soil	S20-Se18904		X					
31	BH404_1.0-1.1	Sep 08, 2020		Soil	S20-Se18905		X					
32	FD02	Sep 08, 2020		Soil	S20-Se18906		X					
33	BH405_0.5-0.6	Sep 08, 2020		Soil	S20-Se18907		X					
34	BH406_1.0-1.1	Sep 08, 2020		Soil	S20-Se18908		X					
35	BH408_1.0-1.1	Sep 09, 2020		Soil	S20-Se18909		X					

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Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
36	BH410_1.0-1.1	Sep 09, 2020		Soil	S20-Se18910		X					
37	BH411_1.0-1.1	Sep 09, 2020		Soil	S20-Se18911		X					
38	BH412_1.0-1.1	Sep 09, 2020		Soil	S20-Se18912		X					
39	BH412_0.5-0.6	Sep 09, 2020		Soil	S20-Se19300			X		X		
40	COMPOSITE 1	Sep 09, 2020		Soil	S20-Se21964				X	X		
41	COMPOSITE 2	Sep 09, 2020		Soil	S20-Se21965				X	X		
42	COMPOSITE 3	Sep 09, 2020		Soil	S20-Se21966				X	X		
43	COMPOSITE 4	Sep 09, 2020		Soil	S20-Se21967				X	X		
Test Counts						12	12	18	4	31	8	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram
ppm: Parts per million
org/100mL: Organisms per 100 millilitres
mg/L: milligrams per litre
ppb: Parts per billion
NTU: Nephelometric Turbidity Units
ug/L: micrograms per litre
%: Percentage
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/kg	< 20			20	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	100			70-130	Pass	
Toluene	%	103			70-130	Pass	
Ethylbenzene	%	105			70-130	Pass	
m&p-Xylenes	%	108			70-130	Pass	
o-Xylene	%	106			70-130	Pass	
Xylenes - Total*	%	107			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	112			70-130	Pass	
TRH C6-C10	%	81			70-130	Pass	
TRH >C10-C16	%	110			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	78			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C10-C14	%	120			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	91			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Acenaphthylene	%	119			70-130	Pass	
Anthracene	%	95			70-130	Pass	
Benz(a)anthracene	%	121			70-130	Pass	
Benzo(a)pyrene	%	126			70-130	Pass	
Benzo(b&j)fluoranthene	%	124			70-130	Pass	
Benzo(g.h.i)perylene	%	119			70-130	Pass	
Benzo(k)fluoranthene	%	122			70-130	Pass	
Chrysene	%	120			70-130	Pass	
Dibenz(a.h)anthracene	%	127			70-130	Pass	
Fluoranthene	%	119			70-130	Pass	
Fluorene	%	114			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	125			70-130	Pass	
Naphthalene	%	108			70-130	Pass	
Phenanthrene	%	108			70-130	Pass	
Pyrene	%	119			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	113			80-120	Pass	
Cadmium	%	111			80-120	Pass	
Chromium	%	109			80-120	Pass	
Copper	%	107			80-120	Pass	
Lead	%	108			80-120	Pass	
Mercury	%	111			80-120	Pass	
Nickel	%	107			80-120	Pass	
Zinc	%	105			80-120	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	87			70-130	Pass	
4.4'-DDD	%	91			70-130	Pass	
4.4'-DDE	%	88			70-130	Pass	
4.4'-DDT	%	89			70-130	Pass	
a-BHC	%	88			70-130	Pass	
Aldrin	%	87			70-130	Pass	
b-BHC	%	85			70-130	Pass	
d-BHC	%	106			70-130	Pass	
Dieldrin	%	86			70-130	Pass	
Endosulfan I	%	87			70-130	Pass	
Endosulfan II	%	85			70-130	Pass	
Endosulfan sulphate	%	89			70-130	Pass	
Endrin	%	87			70-130	Pass	
Endrin aldehyde	%	85			70-130	Pass	
Endrin ketone	%	82			70-130	Pass	
g-BHC (Lindane)	%	88			70-130	Pass	
Heptachlor	%	86			70-130	Pass	
Heptachlor epoxide	%	87			70-130	Pass	
Hexachlorobenzene	%	82			70-130	Pass	
Methoxychlor	%	90			70-130	Pass	
Toxaphene	%	93			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	82			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
BTEX				Result 1					
Benzene	S20-Se19997	NCP	%	87			70-130	Pass	
Toluene	S20-Se19997	NCP	%	76			70-130	Pass	
Ethylbenzene	S20-Se19997	NCP	%	79			70-130	Pass	
m&p-Xylenes	S20-Se19997	NCP	%	81			70-130	Pass	
o-Xylene	S20-Se19997	NCP	%	81			70-130	Pass	
Xylenes - Total*	S20-Se19997	NCP	%	81			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S20-Se19997	NCP	%	79			70-130	Pass	
TRH C6-C10	S20-Se18467	NCP	%	72			70-130	Pass	
TRH >C10-C16	W20-Se17763	NCP	%	93			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	S20-Se18467	NCP	%	72			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	W20-Se17763	NCP	%	101			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S20-Se13488	NCP	%	97			70-130	Pass	
Acenaphthylene	S20-Se13488	NCP	%	104			70-130	Pass	
Anthracene	S20-Se13488	NCP	%	108			70-130	Pass	
Benz(a)anthracene	S20-Se13488	NCP	%	107			70-130	Pass	
Benzo(a)pyrene	S20-Se13488	NCP	%	107			70-130	Pass	
Benzo(b&j)fluoranthene	S20-Se13488	NCP	%	108			70-130	Pass	
Benzo(g.h.i)perylene	S20-Se13488	NCP	%	79			70-130	Pass	
Benzo(k)fluoranthene	S20-Se13488	NCP	%	108			70-130	Pass	
Chrysene	S20-Se13488	NCP	%	102			70-130	Pass	
Dibenz(a.h)anthracene	S20-Se13488	NCP	%	94			70-130	Pass	
Fluoranthene	S20-Se13488	NCP	%	106			70-130	Pass	
Fluorene	S20-Se13488	NCP	%	97			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S20-Se13488	NCP	%	92			70-130	Pass	
Naphthalene	S20-Se13488	NCP	%	93			70-130	Pass	
Phenanthrene	S20-Se13488	NCP	%	92			70-130	Pass	
Pyrene	S20-Se13488	NCP	%	105			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S20-Se18646	CP	%	101			75-125	Pass	
Cadmium	S20-Se18646	CP	%	96			75-125	Pass	
Chromium	S20-Se18646	CP	%	95			75-125	Pass	
Copper	S20-Se18646	CP	%	93			75-125	Pass	
Lead	S20-Se18646	CP	%	95			75-125	Pass	
Mercury	S20-Se18646	CP	%	100			75-125	Pass	
Nickel	S20-Se18646	CP	%	94			75-125	Pass	
Zinc	S20-Se18646	CP	%	93			75-125	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S20-Se18667	CP	%	101			75-125	Pass	
Cadmium	S20-Se18667	CP	%	98			75-125	Pass	
Chromium	S20-Se18667	CP	%	95			75-125	Pass	
Copper	S20-Se18667	CP	%	91			75-125	Pass	
Lead	S20-Se18667	CP	%	95			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Mercury	S20-Se18667	CP	%	103			75-125	Pass	
Nickel	S20-Se18667	CP	%	89			75-125	Pass	
Zinc	S20-Se18667	CP	%	80			75-125	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S20-Se18043	NCP	%	107			70-130	Pass	
4.4'-DDD	S20-Se18043	NCP	%	123			70-130	Pass	
4.4'-DDE	S20-Se18043	NCP	%	109			70-130	Pass	
4.4'-DDT	S20-Se18043	NCP	%	75			70-130	Pass	
a-BHC	S20-Se18043	NCP	%	116			70-130	Pass	
Aldrin	S20-Se18043	NCP	%	120			70-130	Pass	
b-BHC	S20-Se18043	NCP	%	107			70-130	Pass	
d-BHC	S20-Se17846	NCP	%	113			70-130	Pass	
Dieldrin	S20-Se17846	NCP	%	91			70-130	Pass	
Endosulfan I	S20-Se18043	NCP	%	101			70-130	Pass	
Endosulfan II	S20-Se18043	NCP	%	97			70-130	Pass	
Endosulfan sulphate	S20-Se18043	NCP	%	97			70-130	Pass	
Endrin	S20-Se18043	NCP	%	113			70-130	Pass	
Endrin aldehyde	S20-Se18043	NCP	%	94			70-130	Pass	
Endrin ketone	S20-Se18043	NCP	%	92			70-130	Pass	
g-BHC (Lindane)	S20-Se18043	NCP	%	111			70-130	Pass	
Heptachlor	S20-Se18043	NCP	%	105			70-130	Pass	
Heptachlor epoxide	S20-Se18043	NCP	%	110			70-130	Pass	
Hexachlorobenzene	S20-Se18043	NCP	%	115			70-130	Pass	
Methoxychlor	S20-Se18043	NCP	%	74			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	S20-Se13033	NCP	%	76			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S20-Se19438	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S20-Se19438	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S20-Se19438	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S20-Se19438	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S20-Se19438	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S20-Se19438	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S20-Se20761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S20-Se20761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S20-Se20761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S20-Se20761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S20-Se20761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S20-Se20761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S20-Se20761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S20-Se20761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S20-Se20761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S20-Se20761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S20-Se20761	NCP	mg/kg	0.6	0.6	14	30%	Pass	
Fluorene	S20-Se20761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S20-Se20761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Naphthalene	S20-Se20761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S20-Se20761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S20-Se20761	NCP	mg/kg	0.6	0.6	11	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-Se18655	CP	mg/kg	4.4	3.4	25	30%	Pass	
Cadmium	S20-Se18655	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-Se18655	CP	mg/kg	11	12	10	30%	Pass	
Copper	S20-Se18655	CP	mg/kg	25	25	1.0	30%	Pass	
Lead	S20-Se18655	CP	mg/kg	11	11	2.0	30%	Pass	
Mercury	S20-Se18655	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-Se18655	CP	mg/kg	8.0	8.5	7.0	30%	Pass	
Zinc	S20-Se18655	CP	mg/kg	89	100	14	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S20-Se18655	CP	%	5.6	5.3	5.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S20-Se18665	CP	%	1.7	1.6	5.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-Se18666	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	S20-Se18666	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-Se18666	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Copper	S20-Se18666	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	S20-Se18666	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Mercury	S20-Se18666	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-Se18666	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S20-Se18666	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S20-Se18671	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S20-Se18671	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S20-Se18671	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S20-Se18671	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S20-Se18671	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S20-Se18671	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S20-Se18671	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S20-Se18671	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	S20-Se18671	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S20-Se18043	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S20-Se18043	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S20-Se18043	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S20-Se18043	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S20-Se18043	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S20-Se18043	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S20-Se18043	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S20-Se18043	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Dieldrin	S20-Se18043	NCP	mg/kg	0.90	0.68	27	30%	Pass	
Endosulfan I	S20-Se18043	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S20-Se18043	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S20-Se18043	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S20-Se18043	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S20-Se18043	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S20-Se18043	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S20-Se18043	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S20-Se18043	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S20-Se18043	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S20-Se18043	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S20-Se18043	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S20-Se18043	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S20-Se18043	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1221	S20-Se18043	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S20-Se18043	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S20-Se18043	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S20-Se18043	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S20-Se18043	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S20-Se18043	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Andrew Black	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Appendix G – Calibration certificates

PID Calibration Certificate

Instrument **PhoCheck Tiger**
Serial No. **T-113967**

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6 ev			
Alarms	Beeper	✓	**Low**	**High**	**TWA**	**STEL**
	Settings	✓	50ppm	100ppm		
Software	Version	✓				
Data logger	Operation	✓				
Download	Operation	✓				
Other tests:						

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		92ppm Isobutylene	NATA	SY245		91.6ppm

Calibrated by: **Michelle Wagner**

Calibration date: **6/06/2020**

Next calibration due: **3/12/2020**

PID Calibration Certificate

Instrument **PhoCheck Tiger**
Serial No. **T-111087**

airmet

Air-Met Scientific Pty Ltd
1300 137 067

<table>
<tr><th>Item</th><th>Test</th><th>Pass</th><th colspan="4">Comments</th></tr>
<tr><td>Battery</td><td>Charge Condition</td><td>✓</td><td colspan="4"></td></tr>
<tr><td></td><td>Fuses</td><td>✓</td><td colspan="4"></td></tr>
<tr><td></td><td>Capacity</td><td>✓</td><td colspan="4"></td></tr>
<tr><td></td><td>Recharge OK?</td><td>✓</td><td colspan="4"></td></tr>
<tr><td>Switch/keypad</td><td>Operation</td><td>✓</td><td colspan="4"></td></tr>
<tr><td>Display</td><td>Intensity</td><td>✓</td><td colspan="4"></td></tr>
<tr><td></td><td>Operation (segments)</td><td>✓</td><td colspan="4"></td></tr>
<tr><td>Grill Filter</td><td>Condition</td><td>✓</td><td colspan="4"></td></tr>
<tr><td></td><td>Seal</td><td>✓</td><td colspan="4"></td></tr>
<tr><td>Pump</td><td>Operation</td><td>✓</td><td colspan="4"></td></tr>
<tr><td></td><td>Filter</td><td>✓</td><td colspan="4"></td></tr>
<tr><td></td><td>Flow</td><td>✓</td><td colspan="4"></td></tr>
<tr><td></td><td>Valves, Diaphragm</td><td>✓</td><td colspan="4"></td></tr>
<tr><td>PCB</td><td>Condition</td><td>✓</td><td colspan="4"></td></tr>
<tr><td>Connectors</td><td>Condition</td><td>✓</td><td colspan="4"></td></tr>
<tr><td>Sensor</td><td>PID</td><td>✓</td><td colspan="4">10.6 ev</td></tr>
<tr><td></td><td></td><td></td><td colspan="4"></td></tr>
<tr><td>Alarms</td><td>Beeper</td><td>✓</td><td>Low</td><td>High</td><td>TWA</td><td>STEL</td></tr>
<tr><td></td><td>Settings</td><td>✓</td><td>50ppm</td><td>100ppm</td><td></td><td></td></tr>
<tr><td>Software</td><td>Version</td><td>✓</td><td colspan="4"></td></tr>
<tr><td>Data logger</td><td>Operation</td><td>✓</td><td colspan="4"></td></tr>
<tr><td>Download</td><td>Operation</td><td>✓</td><td colspan="4"></td></tr>
<tr><td>Other tests:</td><td></td><td></td><td colspan="4"></td></tr>
</table>

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications.

Diffusion mode Aspirated mode

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		92ppm Isobutylene	NATA	SY245		91.5ppm

Calibrated by: **Jay Marosa**

Calibration date: **3/09/2020**

Next calibration due: **2/03/2021**

Appendix H – Photograph log

Investigation 10th June 2020

Photograph 1: Northern portion of investigation area adjacent Belmont WWTW boundary.

Photograph 2: Central portion of investigation area.

Photograph 3: Eastern portion of investigation area adjacent sand dunes.

Photograph 4: Southern portion of investigation area

Photograph 5: General fill material observed during investigation

Photograph 6: General natural material observed during the investigation

<table>
<tr><th colspan="2">Investigation 8th and 9th of September 2020</th></tr>
<tr><td>Photograph 7: Waste storage area in south western corner of Belmont WWTW site
</td><td>Photograph 8: Southern portion of Belmont WWTW; waste storage bins observed.
</td></tr>
<tr><td>Photograph 9: Dense vegetation observed in southern portion of investigation area
</td><td>Photograph 10: South eastern portion of proposed Belmont Desalination plant area.
</td></tr>
<tr><td>Photograph 11: Eastern portion of investigation area inside Belmont WWTW
</td><td>Photograph 12: Northern portion of investigation area in side Belmont WWTW
</td></tr>
</table>

Photograph 13: General fill material observed at the site

Photograph 14: Natural material observed at the site

GHD

Level 3, GHD Tower
24 Honeysuckle Drive
Newcastle NSW 2300
T: 61 2 4979 9999   F: 61 2 9475 0725   E: ntlmail@ghd.com

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0	A. Brajlih E. Griffin	A. Monkley		N. Malcolm		23/10/2020

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