Report to General Manager

Attachments:
1. Preliminary Site Contamination Report
2. Stage 1 Engagement Summary
3. Stage 2 Engagement Summary (Survey)

SUBJECT: Ex Waverton Bowling Club Site - Post Engagement

AUTHOR: Rob Emerson, Director Open Space and Environmental Services

EXECUTIVE SUMMARY:

As previously reported to Council, when the Waverton Bowling Club went into liquidation, Council staff contacted the NSW Department of Industry - Crown Reserves strongly advocating that this parcel of land should revert on a permanent basis to North Sydney Council's care and control, as per the remainder of the parkland surrounding the Club.

Council gained a six-month lease, executed on 7 May 2019, that fundamentally allowed Council to carry out the initial due diligence on the site including a building condition assessment, a preliminary contamination review and a risk assessment of the grounds. The reports assist in informing the consideration of the future uses for the site; as well as community engagement to determine the preferred specific use of the site (within the sport and recreation reserve category), concurrent with advancing the reintegration of the site into the surrounding Crown Lands.

Council at its meeting of 24 June 2019 resolved (Min. No. 183):

1. THAT Council complete the proposed community engagement for the Ex Waverton Bowling Club Site.
2. THAT on completion of the community engagement a report on the outcomes of the consultation are reported to Council for consideration.
3. THAT an additional $17,500 be made available from the Hayes Street Land & Beach Improvements project to undertake the preliminary contamination site investigation.

In accordance with the above-mentioned resolution, the engagement outcomes are reported to Council, to inform the Council's decision on the proposed long-term future use of the site that will form the application to the NSW Department of Industry - Crown Reserves for tenure in perpetuity.

FINANCIAL IMPLICATIONS:

There are no current financial implications in advocating that the Ex Waverton Bowling Club land be reintegrated into the existing Waverton Park Reserve under Councils Care and Control for the purpose of providing parkland for public recreation. However, in the event the State Government agrees to transfer the land to Council as parkland for public recreation then a cost estimate will need to be prepared and considered in subsequent financial years for ongoing

grounds maintenance, the development of a masterplan and future demolition and desired construction works for the site.

RECOMMENDATION:

1. THAT Council write to the NSW Department of Industry - Crown Reserves strongly advocating the position that the Ex Waverton Bowling Club land must be reintegrated into the existing Waverton Park Reserve under Council's Care and Control for the purpose of providing parkland for public recreation.

2. THAT Council request that the Local Member Felicity Wilson be advised of the community position and asked to advocate for the land to be returned as community parkland for the purpose of providing public recreation.

LINK TO COMMUNITY STRATEGIC PLAN

The relationship with the Community Strategic Plan is as follows:

Direction:	1. Our Living Environment
Outcome:	1.4 Public open space and recreation facilities and services meet community needs

BACKGROUND

The site is located on Woolcott Street, Waverton and sits within the Waverton Park, Crown Reserve. The land was originally gifted to the Crown by the Berry Estate to provide sporting and recreational facilities to the residents of Waverton.

The Waverton Bowling Club was formed in 1947 to play on the proposed bowling green to be constructed in the park in 1948, the second green was constructed in 1950.

The clubhouse had been fabricated during World War II for a hospital in Indonesia. It was delayed being shipped and after the War, was purchased by the newly formed Bowling Club.

North Sydney Council contacted NSW Crown Land (within NSW Department of Industry) when the Waverton Bowling Club went into liquidation, advocating that this parcel of land should revert on a permanent basis to Council's care and control for public recreation, like the remainder of the parkland surrounding the Club.

Council at its meeting of 24 June 2019 resolved (Min. No. 183):

1. THAT Council complete the proposed community engagement for the Ex Waverton Bowling Club Site.
2. THAT on completion of the community engagement a report on the outcomes of the consultation are reported to Council for consideration.
3. THAT an additional $17,500 be made available from the Hayes Street Land & Beach Improvements project to undertake the preliminary contamination site investigation.

Council's Sport and Recreation Reference Group at its meeting of 19 August 2019 considered a report detailing the adopted Engagement Strategy and the findings of the Stage 1 engagement. The minutes of the Reference Group meeting were reported to Council on 23 September 2019 (Min. No. 260).

CONSULTATION REQUIREMENTS

Community engagement was undertaken in accordance with Council's Community Engagement Protocol.

SUSTAINABILITY STATEMENT

The sustainability implications are of a minor nature and did not warrant a detailed assessment.

DETAIL

1. Council's Guiding Strategies/Related Consultations

The opportunity to acquire this site, through re-amalgamation into the surrounding Crown Reserve, is not a specific project identified in the adopted Delivery Program and Budget, however, does relate to the following overarching Council strategies:

1.1 North Sydney Community Strategic Plan 2018-2028

This Plan sets the future direction for the community of North Sydney. The Plan identifies the community's main priorities and aspirations for its future, and details strategies for achieving them. The Plan identifies a key challenge as being the growing demand for sport, recreation and open space. An increasing population means that the demand for open space and sporting and recreation facilities grows. Our challenge is to plan and manage the demand for active and passive recreation and leisure opportunities from our community and visitors with the limited land available.

1.1.1 Delivery Program 2018/19-2020/21

This opportunity relates to the following 'projects' of the adopted Delivery Program under Outcome 1.4 Public open space and recreation facilities and services meet community needs:

- 1.4.1.2 - Investigate opportunities to provide new open space.
- 1.4.1.5 - Investigate potential additional public open space opportunities through redundant crown land uses.
- 1.4.1.7 - Initiate contact with owners of land with potential for use as public open space and to lease these for public use.

1.2 North Sydney Recreation Needs Study 2015

This Study was prepared with the consultants @Leisure and carried out with a high level of community and stakeholder engagement, the Study identifies and analyses the demand for recreation and sports facilities across the North Sydney LGA in order to determine future needs. It forms the basis for future decision-making regarding sport and recreation development in North Sydney. The Study allows Council to provide recreation and sporting facilities and services that meet identified community needs over the next five to ten years.

1.3 Open Space Provision Strategy 2009

North Sydney's network of parks, reserves and civic spaces are under ever-increasing pressure, and the lack of available land and its high cost mean that catering for the open space and recreational needs of a growing population presents a significant challenge. The Strategy is a strategic framework to help assess new open space and recreation sites. The strategy's Site Assessment Procedure aims to ensure that any new open space meets the needs of the population, identifies useful and usable sites in areas of population growth and low open space provision, and does so in an economical and financially sustainable manner.

2. Building Condition Report

The independently conducted building condition assessment report was reported to the Council on 24 June 2019. In summary, the report found that:

"The building is in very poor condition. There is evidence of termites, rot and potential structural issues.

The site has been vacated and the kitchen/bar equipment have all been removed.

Based upon the inspection, a series of works have been identified and budget estimates allowed to rectify. Where further specialist investigation is necessary, we have allowed a budget to undertake the inspection, but the outcomes from the inspections will determine the scope of work and associated cost.

To make this building habitable/rentable, significant works would be required in the order of approximately $360,000 (10% contingency inclusive). Most works in the list are to be addressed in the immediate term (i.e. 2019/20). There are a couple of lifecycle replacement works required in future years…

A number of structural issues were noted which require more detailed investigation. A budget has been allowed for the investigation, but the cost of rectifying cannot be determined until the findings are complete:

- *The wall above the main entry shows evidence of rot/termite damage;*
- *The roof structure outside the office; and*
- *The foundation brick wall.*

The roof requires repair including replacement of gutters and downpipes, and repairs to leaking skylights. The façade cladding shows signs of rot and requires recladding. The verandah floor joists are rotting in various locations and require replacement.

There is evidence of termite damage and a termite investigation/treatment is required. Improved accessibility access is required to meet current code which includes an entry ramp and accessible amenities. A nominal budget allowance of $30,000 has been allowed to create an accessible bathroom.

A full internal and external repaint is require and the replacement of floor coverings has been allowed.

The amenities are in fair condition; however, the vanities have rotted and an allowance to replace has been made. We have not allowed to refurbish the bathrooms completely.

No allowance has been included for the reinstatement of the kitchen.

The air conditioning units are in reasonable condition and their replacement is not expected for at least 5-7yrs."

Based on the building condition report and buildings poor aesthetic and functional qualities it is considered that there is little value in retaining the building in any future development of the site.

3. Site Contamination Report

The preliminary site contamination assessment was undertaken by Golder Associates Pty Ltd (Attachment 1). In summary, the report found that:

"Based on the Preliminary environmental Investigation and limited soil investigation performed at the Waverton Bowling Club site it is considered that the overall potential for widespread significant soil contamination in near surface material to exist at the site is low. The concentrations of potential contaminants of concern were generally below levels considered suitable for recreational land use. However, the following areas of the site are considered to require management or further assessment prior to use of the site for publicly accessible recreational purpose:

- *Surface soil along the southern side of the clubhouse where asbestos cement fragments have been identified and an exceedance of the adopted criterion for asbestos in the soil was reported.*
- *The locations at the southern side of the clubhouse where benzo(a)pyrene and asbestos were detected at concentrations above the adopted criteria.*
- *Soil with the potential to be impacted by pathogens in the vicinity of the septic tanks.*
- *Sub-building soil which has the potential to be impacted by e.g. application of termiticides or leakage from chemicals used to maintain greens. The sub building soil is currently not accessible and would not to be expected to pose a risk to recreational users of the site until exposed by e.g. building demolition.*
- *Deeper fill material may be impacted by e.g. gasworks waste. Whilst this does not appear to preclude the no-intrusive recreational use of the site, these materials would require further assessment if redevelopment involving earthworks is proposed."*

4. Risk Assessment

The risk assessment was undertaken in-house and the relatively minor risks identified were rectified prior to the site being publicly opened for community access.

5. Community Engagement

The Community Engagement Strategy (as adopted 24 June 2019) was undertaken in two stages. The Stage 1 engagement findings as presented to the Sport and Recreation Committee on 19 August 2019 are attached (Attachment 2).

5.1 Stage 1

Stage 1 involved preliminary consultation with identified 'known' key stakeholders, including all Precinct Committees, Waverton Peninsula Working Group members and Sport and Recreation Reference Group members and Waverton Hub to determine after consideration of the site's constraints and opportunities, a few potential options for the future of the site. The purpose of the Stage 1 engagement was to seek suggested preferred uses of the site; not to quantify feedback/preference for the options suggested.

Stage 1 was undertaken from 27 June to 24 July 2019. Council invited key stakeholders to suggest proposed use of the site to inform the Stage 2 wider engagement. A total of 61 emails were received from the following stakeholders:

- 7 from Sport and Recreation Reference Group members, including 6 sporting clubs and one individual;
- 1 from Waverton Peninsula Working Group member;
- 5 from Precinct Committees;
- 1 from Waverton Hub;
- 27 from residents, including individual members of Precinct Committees (14 contained similar content/form submission); and
- 20 'other' - no address provided for confirmation as to whether are local resident (11 contained similar content/form submission).

Council staff collated and analysed Stage 1 submissions. There was a broad range of uses suggested, however, regardless of the preferred use, the unified theme of submissions was that the site needs to remain as public land and meet community needs.

5.2 Stage 2

Stage 2 ran from 19 August to 15 September 2019 and sought wider community feedback via a survey, on the identified uses for the site, seeking ranking/prioritisation of the options provided and written submissions.

Stage 2 promotion/engagement included the following channels:

- Your Say North Sydney project webpage - total visits 1.1K; 828 viewed the page only (aware); 133 visitors downloaded documents (informed); and 332 visitors made a submission online (engaged):
  - Of the total 'informed' visitors:
    - 14 people viewed the site photos with a total of 28 downloads; and
    - 119 people viewed the document library with a total of 251 downloads - 72 Project Background downloads, 64 Stage 1 Engagement Report downloads, 53 Stage 2 Survey (hard copy) downloads, 43 Engagement Strategy downloads and 19 Council Report 24 June 2019 (Building Condition Report) downloads.
- Social media, including:
  - Council Facebook Post 1 (paid boost) - 9,784 Reach; 1,970 Engagements; 1,748 Post Clicks; 80 Comments, 125 Reactions and 17 Shares;
  - Council Facebook Post 2 (paid boost) - 5,921 Reach; 558 Engagements; 502 Post Clicks; 12 Comments, 29 Reactions and 15 Shares;
  - Mosman Living Facebook (paid advert) - 22,240 members; 2 Comments and 3 Reactions;
  - North Shore Living Facebook (paid advert) - 4,736 members; 4 Comments and 6 Reactions;
  - North Shore Mums Facebook (organic reach) - 781 Reach; 21 Engagements; and 21 Post Clicks;
  - Instagram Post 1 - Impressions: 1,542; Reach: 1,010; Hearts: 65; Comments 4;
  - Instagram Post 2 - Impressions: 1,002; Reach: 703; Hearts: 32; Comments 2;
  - Twitter Post 1 - Impressions: 1,173; Total Engagement: 19; Likes: 1, Retweets: 1; and

  - Twitter Post 2 - Impressions: 611; Total Engagement: 6; Likes: 2, Retweets: 0.
- Council e-newsletter - September issue (1,168 subscribers; Unique Opens: 481 (41.32% open rate); Clicked the Link: 30);
- Precincts e-newsletter - weekly for Stage 2 duration/five weeks (160 total subscribers; total Unique Opens: 320; total Clicked a Link: 14); and
- adverts ran in the Mosman Daily on 22 August and 5 September 2019 - it also ran in the Council Round Ups Council Round up in the news section on 22 August.

A total of 384 Stage 2 responses were received:

- 342 online survey responses; and
- 42 written submissions - of these, 19 were written submissions/emails and 23 comments via social media.

The Stage 2 engagement survey findings as Attachment 3. In summary:

- Majority preference is passive recreation (54%), followed by active recreation (42%).
- Majority preference for passive recreation is for social/family recreational space (71%), followed by green open space for relaxation (19%) and other (6%).
- Respondents were asked to rank their passive recreation preferences - if the site is to be used for social/family space, majority preference is for picnic tables and seating, BBQ facilities and shade structure/s.
- Majority preference (average ranking) for active recreation is lawn bowls, including bare foot bowls/casual bowls/boules (average ranking 3.56), followed by 'other' (average ranking 3.94) and outdoor exercise equipment (average ranking 4.06).
- 89% of respondents were from the North Sydney LGA (304 of total 342 responses) - Waverton (35%), followed by Wollstonecraft (20%) and North Sydney (11%). 11% (38) of respondents were from outside the North Sydney LGA.
- 79% of respondents are not associated with a sporting group while 21% are.
- 87% of respondents are not associated with a community group while 13% are.

A total of 43 submissions were received from the following stakeholders (where submitter contact details were provided):

- 11 from residents;
- 1 from a Waverton Peninsula Working Group member;
- 2 from Precinct Committees;
- 1 from a local school;
- 2 commercial operators requesting consideration to operate from the premises; and
- 1 not-for-profit group requesting consideration to operate from the premises.

Whilst the written submissions were free form, they can be categorised by preferred site use:

- 6 support passive recreation, including integration with existing surrounding parklands/playground/dog off leash area, with new facilities/public amenities, permaculture;
- 7 support joint passive recreation/multi-purpose community centre with café;
- 8 support active recreation, including water play park, tennis courts, indoor sports centre, pre/post game facilities or clubhouse;

- 6 support a commercial venture e.g. café/club/wine bar/child care;
- 6 support a multi-purpose community centre, including health and wellbeing classes, arts and craft classes, accommodation for not-for-profit groups, venue hire integrated into surrounding parklands/playground; and
- 9 suggested other uses (not in any order):
  - Markets
  - Aboriginal Arts and Cultural Centre
  - Parking
  - Temporary activations e.g. cinema, ice skating

When the survey and written submissions are considered together, there is majority preference for passive recreation with some form of facilities/amenities over active recreation.

The Stage 1 and Stage 2 feedback should be considered together as not all stakeholders who participated in Stage 1 participated in Stage 2.

6. Next Steps/Recommendations

There was a broad range of uses suggested in the Stage 2 engagement process however as per stage one engagement regardless of the specific preferred use, the unified theme of community submissions was that the site needs to remain as public land for public recreation that meet community needs.

Whilst there was differing views on what specific purpose the site should be ultimately used for i.e. either passive recreation (54% of respondents) or active recreation (42% of respondents) parkland or a mixture of both the strong position that needs to be articulated to the State Government through NSW Crown Land (within NSW Department of Industry) is that the land must be reintegrated into the existing Waverton Park Reserve for the purpose of providing parkland for public recreation that meets the community's needs.

In the event the Council is successful, and the State Government agrees to transfer the land to Councils Care and Control as parkland for public recreation the community engagement undertaken will be the basis for informing the development of a masterplan for the site.

REPORT

PRELIMINARY SITE INVESTIGATION

Former Waverton Bowling Club Site, Woolcott Street, Waverton

Submitted to:

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Submitted by:

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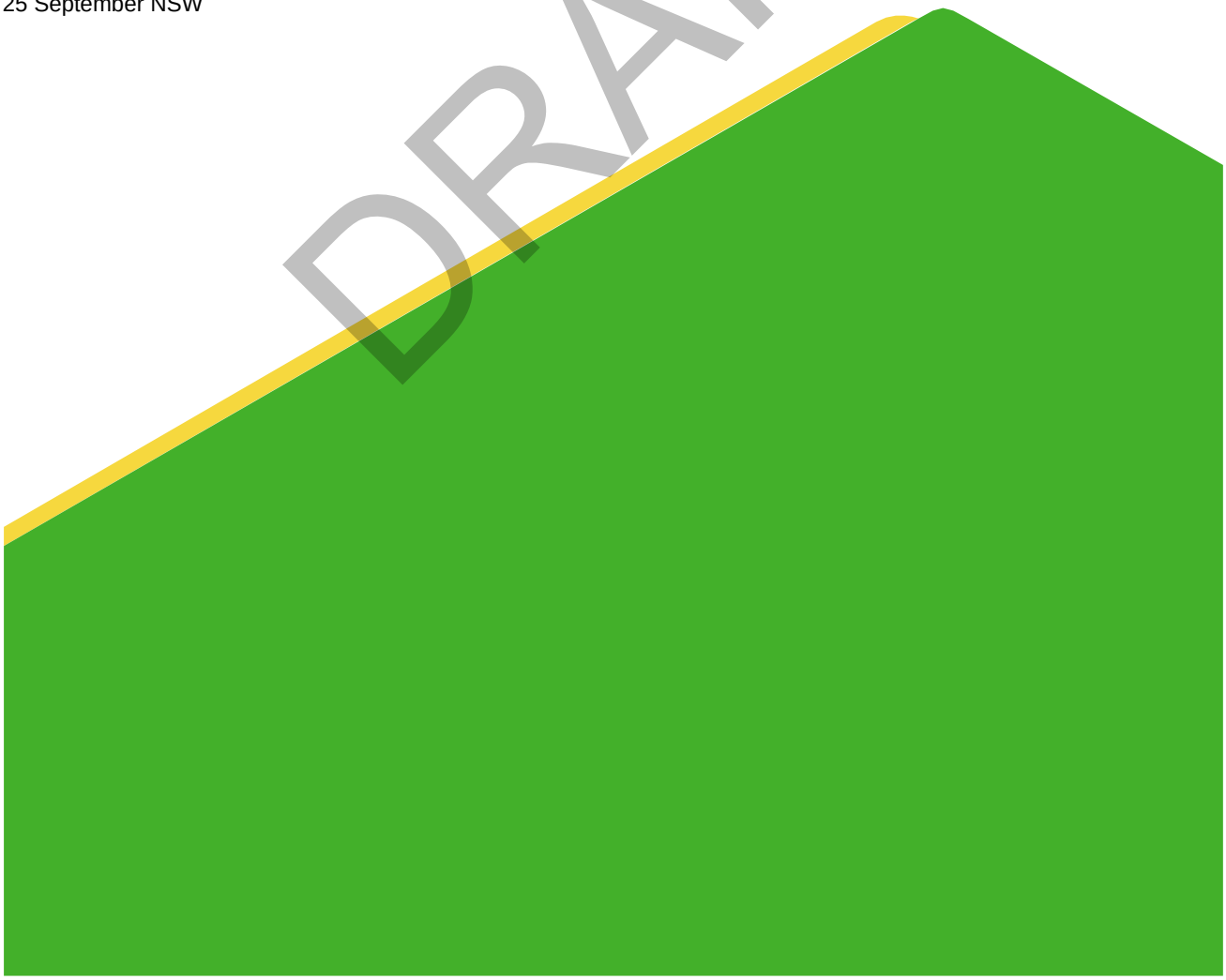
25 September NSW



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North Sydney Council

Golder Associates Pty Ltd

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1.0 INTRODUCTION

North Sydney Council ('Council') engaged Golder Associates Pty Ltd (Golder) to perform a Phase 1 Preliminary Site Investigation (Phase 1 PSI) of the former Waverton Bowling Club site located at Woolcott Street, Waverton NSW (the site). It is understood that the bowling club site is vacant, and that Council is considering entering into a long term lease of the site for use for recreational purposes. The purpose of the assessment was to provide Council with an assessment of potential contamination risk to inform Council's pre-lease due diligence process. The scope of work for the Phase 1 PSI comprised:

- Review of:
  - Certificate of title information to provide a history of ownership and land use;
  - Historical aerial photographs to provide evidence of the history of the sites and the surrounding land uses;
  - Published topographical, geological and hydrogeological information of the area;
  - Environmental registers maintained by the NSW Environment Protection Authority;
  - A Section 10.7 Planning Certificate for the site issued by Council;
- Site inspections;
- A limited soil investigation program; and
- Preparation of this report.

2.0 SITE DESCRIPTION

2.1 Site Identification

The site is the location of the former Waverton Bowling Club located on Woolcott Street Waverton. **Table 1** summarises the identification, location and setting of the site.

A site plan showing the location is attached as **Figure 1**.

Table 1: Site Identification, Location and Setting

Item	Details
Street Address	Woolcott Street Waverton
Approximate Site Area	5,120 m^2
Current Land Use	Recreational use
Legal Property Description	Lot 1205 in Deposited Plan (DP) 752067
Approximate Geographic Co-ordinates (GDA94-MGA56)	333260 mE 6254135 mN
Local Government Area and Land Use Zoning	North Sydney Council RE1 Public Recreation

2.2 Current Site Description

The site occupies Lot 1205 in DP 752067 on the southern side of Woolcott Street. The site is irregularly shaped and has an area of approximately 5,120 m^2. The majority of the site is occupied by two lawn bowling greens which are separated by an open grassed area. The southern part of the site is occupied by the former bowling clubhouse building. The clubhouse building was constructed of various materials including brick, timber and cement sheeting. The rear of the building is elevated above the adjoining Waverton Park, with the area below the building bricked-off to prevent access. Two storage areas were located on the eastern end of the building. A third storage area was located adjacent to the western end of the building. Two septic tanks are located in the south eastern corner of the site. The majority of the site was delineated by low wire mesh fencing, with the clubhouse building forming part of the southern boundary.

2.2.1 Surrounding Land Use

The site is located in an area of predominantly residential land use. Residential land use is present to the north of Woolcott Street and further to the east and west of the site. Waverton Park abuts the western and southern boundaries of the site. Merrett Playground abuts the eastern boundary of the site. Berrys Bay is located further to the south. The surrounding land uses noted at the time of the site inspection are identified in **Table 2**. The nearest sensitive receivers are considered to be the playground located to the east and Berrys Bay located approximately 110 m to the south.

Table 2: Surrounding Land Use

Direction	Details
North	Woolcott Street, residential land use, then the North Shore Railway.

Direction	Details
East	Merrett Playground, a railway siding, then residential land use.
South	Waverton Park then Berrys Bay
West	Waverton Park, Larkin Street, then residential land use.

2.3 Site Inspection

An inspection of the site was completed on 22nd August 2019. The inspection was performed by Mr Shane Doyle. Meteorological conditions during the inspection were overcast, with an approximate temperature of 16°C. Follow up inspections were performed on 2nd and 19th September 2019 to attempt to access the interior of the structures on the site. Observations made during the site inspections and information obtained from the site representative are summarised below. Photographs taken during the inspections are presented in **Appendix A** and the location of significant features shown on **Figure 1**.

The site was a vacated lawn bowling club located on the southern side of Woolcott Street with a children's playground (Merrett Playground) to the east and Waverton Park to the west and south.

Two bowling greens occupied the majority of the northern part of the site. The greens were located at a level approximately 2 m lower than Woolcott Street, with a bank and retaining wall present between the greens and street level. The greens were surrounded by cement paths (**Photograph 1** to **Photograph 5**). The gutter linings on the eastern green were fabricated of metal and cement render. The gutters of the western green had been filled and the gutter linings were not visible. The area between the greens was largely grass covered with a cement paved driveway running from Woolcott Street to the club house building located at the central southern part of the site (**Photograph 6** and **Photograph 8**). A sandstone outcrop was observed at the northern end of this part of the site (**Photograph 7**). Cement paths were present around the greens and along the northern side of the club house. No evidence of distressed vegetation across the greens and central portion of the site was observed. Blue staining[1] was not observed on the retaining walls or sandstone bedrock along the northern side of the site.

The ground floor of the club house building was approximately level with the greens and open area. The sub-floor area at the rear of the club house building had been bricked in (**Photograph 9** and **Photograph 10**). Oil staining was visible below a door to the sub-floor area (**Photograph 11**). The sub-floor area, accessed during a subsequent inspection, appeared to have been used for storage purposes (**Photograph 12**). There was no evidence of high voltage equipment, such as an electrical transformer, in the sub floor area. Some of the pavers in the area were discoloured, potentially from spillage or leakage of stored materials. Sandstone rubble fill was observed extending to the north below the club house building. Fragments of suspected asbestos cement sheet were observed on the ground surface along the southern side of the building (**Photograph 13** and **Photograph 14**).

Two septic tanks were located near the south east corner of the club building (**Photograph 15** and **Photograph 16**). A plan obtained in the land titles search (**Section 3.3**) showed the presence of one septic tank in this area in 1967. Rubble fill was present in the area of the septic tanks (**Photograph 17**).

Access to the interior of the building and the ground level storage areas was available during the follow up inspections. The easternmost storage area, which was accessed through a roller shutter, had a concrete slab

[1] Due to the presence of a ferric ferrocyanide complex, known as "blue billy", commonly associated with gasworks waste.

floor. This storage area had a leaking roof, which resulted in the floor slab being wet and preventing observations of potential staining. An area of potential oil staining was present on the western wall (**Photograph 18**). The adjoining storage area, accessed from the club house, housed wastewater treatment equipment (**Photograph 19**). Minor staining of the floor slab of the western storage area, which was separate from the club house building, was observed (**Photograph 20**). The central part of the main building was an open area (**Photograph 21**), with amenities and offices on the western side of the building and bar and associated facilities on the eastern side.

An honour board located in a storage area indicated that the Waverton Bowling and Recreation Club, a former occupant of the site, was founded in 1947.

3.0 SITE HISTORY

3.1 Sources of Information

Golder undertook an historical review to provide information on previous land use and activities at the site and in the surrounding area, which may have contributed to potential site contamination. The following information sources were reviewed/consulted:

- Historical aerial photographs from the period 1943 to 2019;
- Current and historical Certificates of Title; and
- On-line records.

The outcomes of the site historical review are provided in the following sections.

3.2 Historical Aerial Photographs

Historical aerial photographs from 1943, 1951, 1961, 1972, 1982, 1991 and 1999 were obtained from SIX Maps and NSW Land and Property Information (LPI) for review. Aerial imagery from 2009, 2015 and 2019 was accessed via Nearmap. Copies of the aerial photographs referenced above are included in **Appendix B**.

The aerial photograph review was conducted to ascertain a general history of the development of the site and surrounding area. This review is summarised in **Table 3**.

Table 3: Historical Aerial Photograph Review

Year	Observations
1943	**Site**: The location of the site appeared to be a vegetation covered filled area to the south of Woolcott Street. **Surrounding area**: Residential type structures were present to the north of Woolcott Street and west of Larkin Street. The location of Waverton Park to the south of the site appeared to be a low lying, possibly tidal flats at the northern end of Berrys Bay. Although not visible on the image in **Appendix B**, the former Oyster Cove gasworks were visible to the north west and the former BP oil terminal was visible to the south of the site on the western side of Berrys Bay.
1951	**Site**: Two square features and a building were present on the site, consistent with the current layout of the site. The square features are assumed to be the existing bowling greens. The building was in the location of the existing club house. **Surrounding area**: The area to the immediate east of the site appeared to have been levelled and cleared of high vegetation. The surrounding area otherwise appeared similar to that shown in the 1943 aerial photograph.
1961	**Site**: The site appeared similar to that shown in the 1951 aerial photograph. **Surrounding area**: The area to the immediate south of the site had been filled. A seawall had been constructed at the northern end of Berrys Bay and filling behind the seawall was assumed to have occurred.

Year	Observations
1972	**Site**: A number of features, possibly trees, were present in the central area of the site between the two bowling greens. The size and appearance of the roof of the club house building on the site had changed, possibly indicating the presence of an extended or new club house structure. **Surrounding area**: High rise structures were visible to the north of the North Shore Railway line. The surrounding area otherwise appeared similar to that shown in the 1961 aerial photograph.
1982	**Site**: A small rectangular feature, consistent with the storage area observed during the site inspection, was present on the eastern side of the club house building. The site otherwise appeared similar to that shown in the 1972 aerial photograph. **Surrounding area**: Medium density residential buildings were visible on the northern side of Woolcott Street. The surrounding area otherwise appeared similar to that shown in the 1972 aerial photograph.
1991	**Site**: The site appeared similar to that shown in the 1982 aerial photograph. **Surrounding area**: High rise development had continued to occur to the north of the North Shore Railway line. The surrounding area otherwise appeared similar to that shown in the 1982 aerial photograph.
1999	**Site**: A small rectangular feature, consistent with the storage area observed during the site inspection, was present on the western side of the club house building. The site otherwise appeared similar to that shown in the 1991 aerial photograph. **Surrounding area**: The former BP oil terminal to the south of the site was being redeveloped. Additional medium density residential buildings were visible on the northern side of Woolcott Street.
2009	**Site**: The site appeared similar to that shown in the 1999 aerial photograph. **Surrounding area**: The surrounding area otherwise appeared similar to that shown in the 1999 aerial photograph.
2015	**Site**: A number of features, potentially tents or marquees, were present in the area between the two bowling greens. The site otherwise appeared similar to that shown in the 1999 aerial photograph. **Surrounding area**: The surrounding area otherwise appeared similar to that shown in the 2009 aerial photograph.
2019	**Site**: The assumed tents or marquees had been removed from the site. The site otherwise appeared similar to that shown in the 2015 aerial photograph. **Surrounding area**: The surrounding area otherwise appeared similar to that shown in the 2015 aerial photograph.

3.3 Historical Certificates of Titles

A summary of the historical ownership of the site is presented in **Table 4**. Copies of the available titles and plans are included as **Appendix C**.

Table 4: Summary of Land Title Information

Year	Source	Comment
Undated	1205/752067	Owner identified as the State of New South Wales The title search indicated that the certificate of title had not been issued.
Undated	Prior title search	Prior title to the site was Crown Land
1967	Crown Plan 9325.2030	The plan shows the presence of two bowling greens, a club house, a small shed and a septic tank on the site.

3.4 On-line Records

A search of on-line records[2] indicated that the location of the site was part of two acres (approximately 8,100 m^2) acquired in 1944 by North Sydney Council to form a recreational reserve. The purported previous ownership of the site by Council is inconsistent with the results of the land titles search. The recreational reserve was to include a bowling club and children's playground. Part of the area below the current bowling greens and Waverton Park were reported to have been filled with waste material, identified as clinker, from the Oyster Cove gasworks. The fill was reported to have been replaced following ignition of gases emanating from the gasworks waste (NSHS 1994).

3.5 Street Directories

A 1934 street directory did not identify the presence of the bowling club at the site. Directories dating from the early 1970s onwards identified the bowling club and Waverton Park.

3.6 Previous Environmental Assessment Reports

Golder is not aware of previous environmental investigations at the site.

3.7 Site History Summary

The site is currently owned by the State of New South Wales, and was previously Crown Land. However, there are inconsistencies in the reported historical ownership of the site. The site was reported to have been filled with waste material from the former Oyster Cove gasworks prior to the establishment of bowling greens in the mid to late 1940s. The original fill material was reported to have been subsequently removed from the site. Aerial photographs from the early 1950s onwards, and a 1966 survey shown on a Crown Plan show the presence of two bowling greens and a club house building, generally consistent with observations made during the site inspection. Based on the historical aerial photographs there is the potential that the original club house building was renovated or replaced by the early 1970s.

Although there are some gaps in the site history, it is considered the available information was of sufficient standard to identify if potentially contaminating activities had occurred on the site.

[2] https://www.northsydney.nsw.gov.au/files/.../H4_WavertonStation_BallsHead.pdf

4.0 ENVIRONMENTAL SETTING

4.1 Topography and Drainage

The site is located on a generally level area with an elevation of approximately 20 metres Australian Height Datum (mAHD) (SIX Maps 2019). The surrounding area falls to the south towards Berrys Bay. Surface run off from the site would be expected to drain to Berrys Bay approximately 110 m to the south of the site.

4.2 Surface Water

No permanent surface water features are present on the site. The nearest surface water feature to the site is Berrys Bay located approximately 110 m to the south.

4.3 Geology and Hydrogeology

4.3.1 Geology

A review of the 1:100,000 scale Sydney Geological Series Sheet 9130 (DMR 1983) indicates that the site is located in an area mapped with Hawkesbury Sandstone as the underlying formation. The Hawkesbury Sandstone formation comprise medium to coarse grained quartz sandstone with very minor shale and laminate lenses.

4.3.2 Soils and Landscapes

Based on review of on-line mapping on the eSPADE[3] web site residual soil at the site would be part of the Gymea soil landscape. Soils of the Gymea soil landscape are typically shallow to moderately deep *Yellow Earths* and *Earthy Sands* on crests and inside of benches, shallow *Siliceous Sands* on the leading edge of benches, localised *Gleyed Podzolic Soils* and *Yellow Podzolic Soils* on shale lenses, and shallow to moderately deep *Siliceous Sands* and *Leached Sands* along drainage lines. Residual soil at the site would be expected to be highly permeable, have very low soil fertility, have a high erosion hazard and have rock outcrops (Chapman et al 1989).

4.3.3 Lithology

Based on the site inspection (**Section 2.3**), aerial photographs (**Section 3.2**) and site history (**Section 3.4**) fill is present at the site. The fill material is likely to include wastes from the Oyster Cove gasworks. The majority of fill at the site was placed prior to the establishment of the bowling greens in the mid 1940s.

4.3.4 Acid Sulfate Soils

Acid sulfate soils (ASS) planning maps were originally prepared by the NSW Department of Land and Water Conservation to indicate the potential presence of ASS, rather than the severity of ASS at a particular location. The planning maps identify five classes of ASS (Class 1 to Class 5) and identify types of work likely to present an environmental risk for each class of land (ASSMAC 1998). There are no ASS planning sheets associated with North Sydney Local Environment Plan 2013 (the LLEP) (NSC 2013) indicating there is a low risk of ASS at the site.

On-line ASS mapping hosted by the Australian Soil Resource Information System (ASRIS) was reviewed through a Google Earth interface. The ASRIS mapping is based on existing data sets which have been converted to a national classification system (ASRIS 2011). ASRIS shows the site as being in an area which is not identified as having ASS. The lower section of Waverton Park adjacent to Berrys Bay located in an area mapped with of “low probability” for the occurrence of ASS.

[3] The data accessible through eSPADE is mainly sourced from the NSW Soil and Land Information System, including soil landscape mapping data.

4.3.5 Hydrogeology

A search of on-line records held by the NSW Department of Primary Industry Office of Water was performed on 6 August 2019. The search indicated there were no licensed groundwater bores located within 500 m of the site. The results of the search is presented in **Appendix D**.

4.3.6 Groundwater Management Zones

The site is not located within a Groundwater Management Zone managed by the NSW government.

4.4 Climate

Meteorological conditions at the site have been inferred from long term records for the Observatory Hill meteorological station, which is located approximately 2.3 km to the south east of the site. The mean annual rainfall would be in the order of 1216 mm, the wettest month being June and the driest month being September. The mean number of days in a year with rain of 25 mm or higher would be in the order of 12 days. The mean maximum temperature would be in the order of 22 °C. The warmest month would be January, with the highest temperature recorded at Observatory Hill of 45.8 °C recorded on 18 January 2013. The mean minimum temperature would be in the order of 14 °C. The coldest month would be July, with the lowest temperature recorded at Observatory Hill of 2.1 °C recorded on 22 June 1932.

5.0 REGULATORY AGENCY RECORDS SEARCHES

As part of the Phase 1 ESA the following published information sources were consulted in respect of the site:

- State databases including:
  - On-line records held by the NSW Environment Protection Authority (EPA), including:
    - The record of notices issued under the *Contaminated Land Management Act 1997* (the *CLM Act*);
    - The public register maintained under Section 308 of the *Protection of the Environment Operations Act 1997* (the *POEO Act*); and
    - The list of sites notified to the EPA under Section 60 of the *CLM Act*; and
- Council documentation including Section 10.7 (2) and (5) Planning Certificates and planning sheets associated with the North Sydney LEP.

A search of records maintained by SafeWork NSW relating to the storage of hazardous chemicals (formerly referred to as “dangerous goods”) was not performed as it was considered there was a low potential for underground storage tanks to be present at the site.

5.1 NSW Environment Protection Authority

A search of on-line records held by the NSW EPA was completed. The search findings are presented below.

5.1.1 CLM Act Notices

The EPA maintains a “Record of Notices” which is a contaminated land public record. The record includes orders made under Part 3 of the *CLM Act*, notices available to the public under Section 58 of the *CLM Act*, site audit statements provided to the EPA under Section 53B of the *CLM Act*, actions taken by the EPA under Sections 25 or 36 of the *Environmentally Hazardous Chemicals Act 1985*, approved voluntary management proposals and copies of information formerly required to be part of the public record.

An on-line search for notified sites in the North Sydney LGA was performed on 6 August 2019. The result of the search, limited to premises within 500 m of the site, is presented in **Table 5** below.

Table 5: CLM Notice Search Results

Premises	Approximate distance from site	Comment
SRA Land 95 Bay Road, Waverton	270 m to north west	Three former notices had been issued on the premises. The location was declared a remediation site in 2003 due to the presence of benzo(a)pyrene, total polycyclic aromatic hydrocarbons and lead at concentrations which exceeded investigation levels for standard residential land use. Notices ending the remediation declaration and acknowledging the completion of a voluntary remediation proposal were issued in June 2007.
Oyster Cove AGL 2 King Street, Waverton	360 m to north west	One current notice applies to the premises, with seven former notices revoked between 1996 and 1998. The current notice requires implementation of an environmental management plan for the site and requires written approval from the EPA prior to

Premises	Approximate distance from site	Comment
		construction of any building, disturbance of the site beyond a depth of 0.5 m, or disturbance to the on-site containment cell.

It is considered that current activities at the premises identified in the above search would have a low potential to impact upon the site. As noted in **Section 3.4** the site was filled with waste material from the former Oyster Cove gasworks prior to the mid 1940s. A copy of the results of the notice search is provided in **Appendix E**.

5.1.2 Notifications under Section 60 of the CLM Act

The NSW EPA maintains a "List of NSW contaminated sites notified to the EPA" under Section 60 of the *CLM Act*. Sites on this list indicate that the notifiers consider that the sites are contaminated and warrant reporting to the NSW EPA. The contamination at the site may or may not be significant enough to warrant regulation by the EPA and the EPA reviews relevant site information before making a determination as to whether or not the site warrants regulation. An on-line search for notified sites in Waverton and the surrounding suburbs of North Sydney, McMahons Point and Wollstonecraft was performed on 6th August 2019. The result of the search, limited to premises within 500 m of the site, is presented in **Table 6** below.

Table 6: Section 60 Notification Search Results

Premises	Approximate distance from site	EPA management status
SRA Land 95 Bay Road, Waverton	270 m to north west	Contamination formerly regulated under the *CLM Act*.
Oyster Cove AGL 2 King Street, Waverton	360 m to north west	Ongoing maintenance required to manage residual contamination (*CLM Act*).
Berry's Bay Woodley's Marina 1 Balls Head Road, Waverton	500 m to south	Contamination formerly regulated under the *POEO Act*.

Two of the premises notified under Section 60 of the *CLM Act* were identified in the Record of Notice search describe in **Section 5.1.1**. It is considered that current activities at the premises identified in the above search would have a low potential to impact upon the site. A copy of the results of the notice search is provided in **Appendix E**.

5.1.3 EPLs under the POEO Act

The NSW EPA maintains a public register of premises subject to an Environment Protection Licence (EPL) under the *POEO Act*.

An on-line search for premises in Waverton and the surrounding suburbs of North Sydney, McMahons Point and Wollstonecraft was performed on 6th and 7th August 2019. The result of the search, limited to premises within 500 m of the site, is presented in below.

Table 7: EPL Search Results

Premises	Approximate distance from site	Activity type	Licence status
Noakes Boatyard 6 John Street, McMahons Point EPL 10893	300 m to south east	Boat construction/ maintenance (general)	Issued
Woodley (Berrys Bay) Pty Limited 1 Balls Head Road, Waverton EPL 6322	500 m to south	Marinas and boat repairs	Surrendered

It is considered that the premises identified in the above search would have a low potential to impact upon the site. A copy of the results of the notice search is provided in **Appendix E**.

5.1.4 Penalty Notices Issued under the POEO Act

The NSW EPA maintains a public register of Penalty Notices under the *POEO Act*.

A search of the Penalty Notices register issued by the NSW EPA under the *POEO Act* was performed on 7th August 2019 for the North Sydney LGA. One Penalty Notice was issued on a shipyard located approximately 300 m to the south east of the site. A copy of the results of the penalty notice search is provided in **Appendix E**.

5.2 Local Council

Section 10.7 (2) & (5) planning certificates for the site, issued under Section 10.7 of the *Environmental and Planning Assessment Act 1979*, were obtained from North Sydney Council. The planning certificates, issued on 7 August 2019, included the following information relating to potential contamination issues:

- The site is zoned RE1 Public Recreation;
- Council is not aware that the land is not affected by any matter listed in Clause 59(2) of the *Contaminated Land Management Act 1997*, i.e. the land is not significantly contaminated, is not the subject to a management order, is not the subject of an approved voluntary management proposal, is not subject to an ongoing maintenance order and Council has not received a Site Audit Statement for the site;
- The land is not affected by a policy adopted by Council which would restrict development because of the likelihood of land slip, bush fire, flooding, tidal inundation or acid sulfate soils or any other risk; and
- The site does not contain a heritage item and is not located within a heritage conservation area.

The planning certificate reported that the site owner, as recorded by Council, was The North Sydney Club Ltd. This is inconstant with the results of the title search documented in **Section 3.3**.

A copy of the Section 10.7 (2) & (5) planning certificates for the site is presented in **Appendix F**.

5.3 Department of Defence

A search of the Department of Defence unexploded ordnance (UXO) mapping application was performed on 7 August 2019. The search indicated that the site was not identified as potentially impacted by UXO. A copy of the search result is presented in **Appendix G**.

6.0 PRELIMINARY INTRUSIVE INVESTIGATION PROGRAM

Five boreholes, identified as BH01 to BH05, were drilled on 2 September 2019 to obtain preliminary information to assess the potential for contamination at the site. In addition, a surface sample was collected from soil in the vicinity of oil staining on the building fabric and a fragment of suspected asbestos cement sheet was collected for analysis. The location of the boreholes and surface sampling locations are shown on **Figure 1**. Although the number of investigation locations does not comply with the minimum number of locations recommended in the *Sampling Design Guidelines* (EPA 1995), the investigation program is considered appropriate to identify gross contamination in near surface soils on the site which may inform Council's decision to take out a lease on the site.

Fill material comprising silty sand, ballast, sandstone and clinker was identified at depths of up to 0.95 m below ground level (mbgl). Hand auger refusal was encountered at depths ranging between 0.7 mbgl and 0.95 mbgl in sandstone fill. No chemical type odours were observed during the sampling. The maximum headspace PID reading obtained of 1.9 parts per million (ppm) indicated a low potential for the presence of volatile organic compounds at the investigation locations. Clinker (i.e. residue from the combustion of coal) was observed in fill at locations BH01, BH03, BH04 and BH05. Water was observed entering BH05 at a depth of approximately 0.85 mbgl. Copies of borelogs are presented in **Appendix H**. Sample Trans01, not identified on the borelogs, was collected from surface fill adjacent to an oil stained door entrance. The fill was described as brown silty sand, with low plasticity silt. Sample ASB01 was a fragment of fibre cement sheet collected from the ground surface in the vicinity of the location of sample Trans01.

Selected soil samples obtained during the intrusive investigation were submitted for chemical analysis to obtain preliminary information on the likely type and concentrations of potential contaminants of concern (PCoC). The samples by an environmental scientist, experienced in the collection of environmental samples, using a hand auger.

The soil samples were submitted to Australian Laboratory Services (LS) and Envirolab Services (ELS), both of which are National Association of Testing Authorities, Australia (NATA) accredited for the analyses performed[4].

The samples were analysed for PCoC comprising:

- Total recoverable hydrocarbons (TRH);
- Benzene, toluene, ethyl benzene, xylene and naphthalene (BTEXN);
- Polycyclic aromatic hydrocarbons (PAH);
- Speciated phenols;
- Organochlorine pesticides (OCP);
- Organophosphorous pesticides (OPP);
- Polychlorinated biphenyls (PCB);
- Semi-volatile organic compounds (SVOC);
- Free cyanide;
- Ammonia;

[4] ALS is not NATA accredited for determination of asbestos weights and percentages to the reporting limits required by NEPC 2013.

- Metals (arsenic, cadmium, copper, chromium, lead, mercury, nickel and zinc); and
- Asbestos.

The PCoC were based on the former use of the site as a lawn bowling club, the historical filling of the site with waste material from the Oyster Cove gasworks site, and typical contaminants found on urban sites. In particular metals, ammonia, cyanide, PAH and SVOC were selected as they are commonly associated with gasworks waste and metals, OCP and OPP were selected as they are associated with fungicides and pesticides applied to greens.

Laboratory documentation and chain of custody records are presented in **Appendix I**, summary tables are presented in **Appendix J** and data validation records are presented in **Appendix K**. The data validation determined that the laboratory analytical results were suitable for environmental interpretive use

The soil analytical results, presented in **Table J1** in **Appendix J**, were compared to health investigation and screening levels for public open space (HIL C and HSL C) documented in the *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPC 2013) (the NEPM) for the assumed recreational open space land use. The results were also compared to the ecological investigation and screening levels (EIL C and ESL C) assuming there would be accessible soil under the proposed land use. As the scope of the assessment excluded the collection and analysis of samples to estimate site specific EILs for metals, the most conservative added contaminant limit (ACL) for the respective metals was adopted as the EIL.

Asbestos and benzo(a)pyrene (BaP, a PAH compound) were reported at concentrations above the open space screening levels in surface soil at the entrance to the sub-floor area at the rear of the club house building (sample Trans01). The reported asbestos (as >7mm ACM) concentration of 0.13 % exceeded the HSL of 0.02 %. The reported BaP concentration of 2.2 mg/kg and BaP TEQ[5] concentration of 3.4 mg/kg exceeded the ESL and HSL of 0.7 mg/kg and 3 mg/kg respectively.

The soil analysis results were otherwise below the screening levels adopted in the NEPM for public open space land use. Organic analytes (other PAH compounds in in sample Trans01) were generally not detected with the exception of low levels of organochlorine pesticides in near-surface soil at location and F3 and F4 TRH fractions in samples collected from BH01 and Trans01.

A sample of suspected asbestos cement sheet collected from the ground surface near the entrance to the sub-floor area at the rear of the club house building (sample ASB01) was analysed for asbestos presence or absence. The fragment of cement sheet was shown to contain chrysotile asbestos.

[5] A measure of carcinogenic PAH compounds.

7.0 SUMMARY OF ASSESSMENT

7.1 Summary

Based on a review of desktop information and the limited soil sampling, Golder has undertaken a Preliminary Environmental Investigation of the former Waverton Bowling Club site.

In summary:

- The site is located on Lot 1 in DP 752067, has an area of approximately 5,120 m^2, and is zoned RE1 Public Recreation;
- The site is owned by the State of New South Wales;
- The site is located in an area of the Gymea soil landscape. Residual soils at the site, if present, would be highly permeable, have very low soil fertility and have a high erosion hazard;
- The site is located in an area which is not identified as having ASS (ASRIS 2011);
- The site has been used for recreational purposes as a bowling club since the 1940s until the Waverton Bowling Club entered liquidation in early 2019;
- The site is not the subject of a Notice issued under the *CLM Act*. The nearest premises to the site subject to current or former Notices are more than 250 m from the site and are considered to have a low potential to impact upon the site;
- The site has not been subject to an EPL under the *POEO Act*. The nearest premises subject to an EPL, or formerly subject to an EPL, is located some 300 m to the south east, and is considered to have a low potential to impact upon the site;
- The site has not been notified under Section 60 of the *CLM Act*. The nearest premises notified to the EPA is located some 270 m to the north west, and is considered to have a low potential to impact upon the site;
- Identified land use activities with the potential to contaminate the site include importation of fill, storage and application of chemicals to the bowling greens, potential demolition or renovation of the bowling club building, application of termiticides below the building, and the presence of septic tanks;
- A limited sampling and analysis program was performed to identify gross contamination in near surface soils on the site. The number of investigation locations did not comply with the minimum number of locations recommended in the *Sampling Design Guidelines* (EPA 1995) and did not include an assessment of groundwater at the site;
- The results of the soil sampling and analysis program were generally below levels considered suitable for recreational land use. However, exceedances of the screening levels for asbestos and BaP were reported in one surface soil sample collected from adjacent to the southern side of the building; and
- Fragments of potential asbestos cement sheet were observed on the ground surface on the southern side of the building. Laboratory analysis of one fragment confirmed the material contained chrysotile asbestos.

7.2 Potential Contamination Risk

The results of the desktop site history review, site inspection and limited opportunistic sampling and analysis was used to assess the potential for past and current activities on the site to have resulted in contamination which may pose a risk to the proposed recreational use of the site.

The following contamination risks have been identified at this preliminary stage:

- The importation of uncontrolled fill including material from the Oyster Cove gasworks;
- The presence of asbestos cement fragments on the ground surface on the southern side of the building, and associated asbestos contamination of surface soils in the area;
- Localised PAH impact in surface soil at a sample location on the southern side of the building;
- The potential for application of termiticides below the building and of fungicides, pesticides and herbicides to the bowling greens;
- The potential for spillage or leakage of chemical containers in the storage areas; and
- The presence of pathogens in site soil from potential leakage from the septic tanks on the site.

8.0 CONCEPTUAL SITE MODEL

A Conceptual Site Model (CSM) has been developed following the desktop information and the limited soil sampling during. The CSM aims to provide an understanding of the potential for exposure to site contaminants of potential concern and associated impacts on the proposed recreational land use of the site.

Identified historical and current land use activities that may have contributed to potential contamination sources at the site include:

- Historical importation of fill material, including importation of potentially impacted fill from the Oyster Cove gasworks;
- Potential application of lawn maintenance chemicals to the bowling greens;
- Potential application of termiticides to site buildings; and
- Storage of lawn maintenance chemicals.

Transportation mechanisms are considered to include:

- Direct release to soil;
- Stormwater transportation of soil particles;
- Entrainment of contaminants into wind-blown dust;
- Migration of contaminants to surface or groundwater.

Exposure pathways are considered to include:

- Direct contact with soil/fill;
- Ingestion of soils or soil derived dust;
- Inhalation of soil derived dust;
- Inhalation of fibres;
- Direct contact with impacted ponded surface water;
- Inhalation of aerosols of impacted ponded surface water; and
- Incidental ingestion of impacted ponded surface water.

Potential receptors based on the proposed recreational land use were identified as:

- Future recreational users;
- Future maintenance workers; and
- On and off-site flora and fauna.

The potential contaminant sources and migration or exposure pathways identified have the potential to form pollutant linkages which may pose a risk to a receptor. These can be summarised as a preliminary CSM for the proposed recreational use of the site as presented in **Table 8**.

Table 8: Preliminary Conceptual Site Model

Primary Sources	Secondary Sources	Transport Mechanisms	Exposure Pathways	Receptors
• Historical importation of uncontrolled fill. • Potential application of chemicals to the bowling greens. • Potential application of termiticides to site buildings. • Storage of chemicals.	• Potentially impacted soil	• Direct release to soil • Stormwater transportation of soil particles. • Entrainment of contaminants into wind-blown dust. • Leaching of contaminants to surface water / groundwater	• Direct contact with soil/fill. • Incidental ingestion of soil/fill. • Inhalation of soil/fill derived dust. • Inhalation of fibres. • Contact with impacted ponded surface water. • Inhalation of aerosols of impacted ponded surface water. • Incidental ingestion of impacted surface water or groundwater.	• Future recreational users of the site. • Future maintenance workers. • On and off-site flora and fauna.

9.0 CONCLUSIONS

Based on the Preliminary Environmental Investigation and limited soil investigation performed at the former Waverton Bowling Club site it is considered that the overall potential for widespread significant soil contamination in near-surface material to exist at the site is low. The concentrations of potential contaminants of concern were generally below levels considered suitable for recreational land use. However, the following areas of the site are considered to require management or further assessment prior to use of the site for publicly accessible recreational purposes:

- Surface soil along the southern side of the clubhouse where asbestos cement fragments have been identified and an exceedance of the adopted criterion for asbestos in soil was reported;
- The locations at the southern side of the clubhouse where benzo(a)pyrene and asbestos were detected at concentrations above the adopted criteria;
- Soil with the potential to be impacted by pathogens in the vicinity of the septic tanks;
- Sub-building soil which has the potential to be impacted by e.g. application of termiticides or leakage from chemicals used to maintain the greens. The sub-building soil is currently not accessible, and would not be expected to pose a risk to recreational users of the site until exposed by e.g. building demolition; and
- Deeper fill material may be impacted by e.g. gasworks wastes. Whilst this does not appear to preclude the non-intrusive recreational use of the site, these materials would require further assessment if redevelopment involving earthworks is proposed.

Potential management strategies to enable use of the site for recreational purposes in its current form include:

- Performing limited remediation works along the southern side of the clubhouse to remove the asbestos and PAH impacted soil from site;
- Covering the surface soil at the southern side of the clubhouse building to limit the potential for exposure of users of the site to the contaminants; and
- Implementation of a site management pan.

Equally, these measures could be achieved through targeted works during a broader site redevelopment strategy.

10.0 LIMITATIONS

Your attention is drawn to the document titled - “Important Information Relating to this Report”, which is included in **Appendix L** of this report. The statements presented in that document are intended to inform a reader of the report about its proper use. There are important limitations as to who can use the report and how it can be used. It is important that a reader of the report understands and has realistic expectations about those matters. The Important Information document does not alter the obligations Golder Associates has under the contract between it and its client.

11.0 REFERENCES

ASRIS 2011 *ASRIS – Australian Soil Resource Information System*. http://www.asris.csiro.au. Accessed August 2019.

DMR 1993 *Sydney 1:100 000 Geological Sheet 9130 (Edition 1)*, Geological Survey of New South Wales, Department of Mineral Resources, 1983.

EPA 1995 *Sampling Design Guidelines*, NSW Environment Protection Authority, 1995.

NEPC 2013 *National Environment Protection (Assessment of Site Contamination) Measure 1999,* National Environment Protection Council, 2013.

NSC 2013 *North Sydney Local Environment Plan 2013*, North Sydney Council, 2013 (as amended).

NSHS 1994 *Walk 4 Waverton Station to Balls Head*, North Shore Historical Society, 1994.

Signature Page

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https://golderassociates.sharepoint.com/sites/112349/project files/6 deliverables/19126714-001-r-reva phase 1.docx

Figure

LEGEND

- Site Boundary
- Asbestos Sample
- Hand Auger
- Grab Sample

Site features

1. Clubhouse
2. Eastern Green
3. Western Green
4. Eastern Storage Area
5. Western Storage Area
6. Septic Tanks

0 30 60

1:900 METRES

NOTE(S)

1. COORDINATE SYSTEM: GDA 1994 MGA ZONE 56

REFERENCE(S)

1.

CLIENT
NORTH SYDNEY COUNCIL

PROJECT
PRELIMINARY SITE INVESTIGATION
FORMER WAVERTON BOWLING CLUB SITE
WOOLCOTT ST, WAVERTON

TITLE
SITE LAYOUT, FEATURES AND INVESTIGATION LOCATIONS

CONSULTANT

GOLDER

DD-MM-YYYY	24-09-2019
DESIGNED	EAA
PREPARED	EAA
REVIEWED	SD
APPROVED	SD

PROJECT NO.	CONTROL	REV.	FIGURE
19126714	001-R	0	1

APPENDIX A

Site Inspection Photographs

1. View to south east across the eastern bowls green. Based on the presence of weeds on the green indicate the green has not been used for lawn bowls in the recent past.

2. Retaining wall on the northern side of the eastern green. The metal and render lining of the green gutters is visible on the right side of the image.

3. View to west along the southern side of the eastern green. A retaining wall is visible on the left side of the image

4. View to north west across the western green with Waverton Park and Woolcott Street in the background.

5. Concrete cylinders used as part of a retaining structure between Woolcott Street and the western green.

6. View to north towards Woolcott Street across the open area between the two greens.

7. Sandstone outcrop near the northern side of the site between the two greens.

8. View to south from Woolcott Street to the club house building. Two storage areas were present on the eastern side of the building, and one storage area was present on the western side of the building (not visible in this photograph).

9. View to north east across Waverton Park to the southern side of the club house building.

10. View of the rear of the club house building showing the bricked-in sub-floor area.

11. Oil staining below a door near the eastern end of the club house building. No access to area was available during the initial site inspection. Soil sample Trans01 was collected from the surface soil adjacent to the door opening.

12. View across sub-floor area to the west. The area had been used for storage purposes. High voltage equipment was not present in the area contrary to the high voltage warning sign on the access door. Sandstone rubble fill, visible on the right of the image, appeared to extend below the building.

13. Fragments of suspected asbestos cement sheet on the ground surface on the southern side of the building (pen for scale).

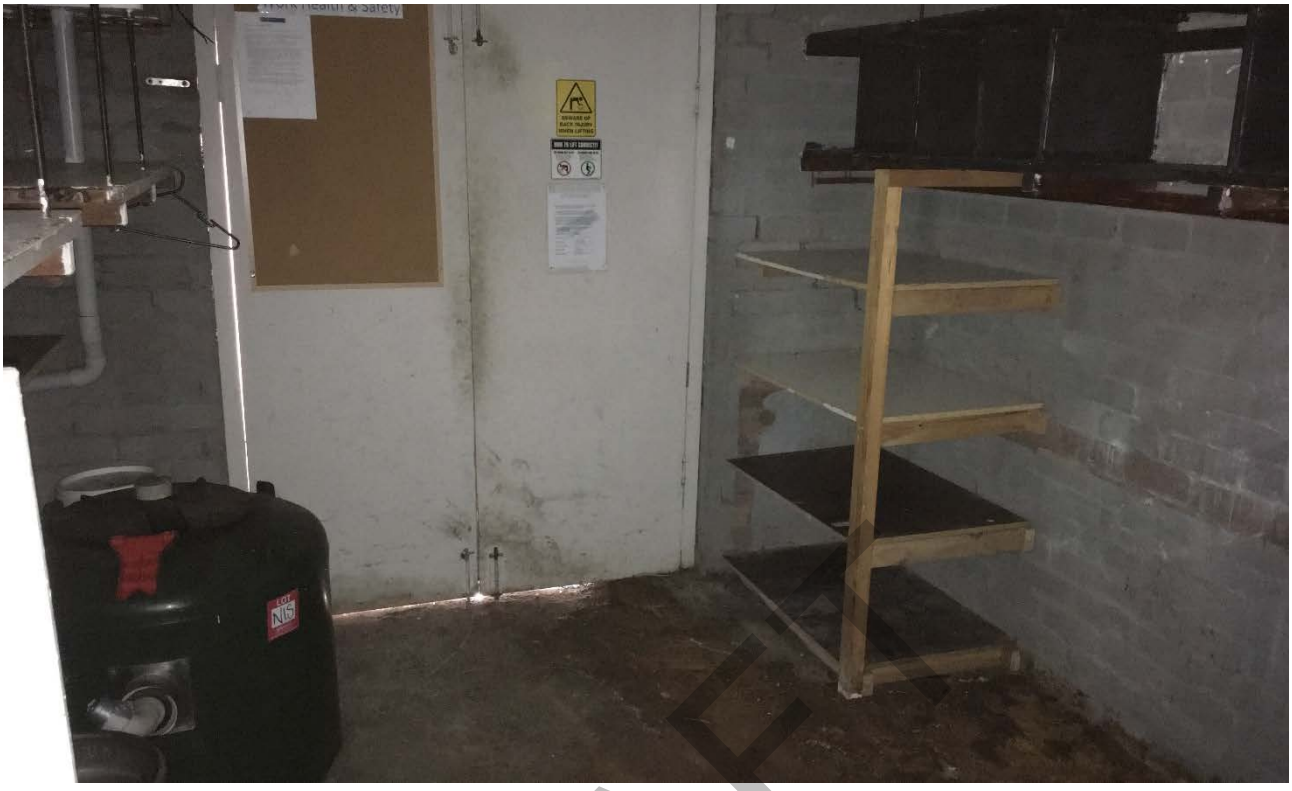
14. Close up of suspected asbestos cement sheet fragment. Laboratory analysis confirmed the presence of chrysotile asbestos in the cement sheet.

15. Septic tank located at the south east corner of the building. A second septic tank is present is located in this area but is not visible in this photograph.

16. View from above of two septic tanks at the south east corner of the building.

17. Rubble located adjacent to the southern boundary of the site.

18. View to interior of the easternmost storeroom. Note the potential oil staining on the concrete floor and on the brick wall.



19. View of interior of storeroom accessed from inside the building. The area housed wastewater treatment equipment.

20. View of interior of western storeroom. Minor staining of the concrete floor slab was observed.

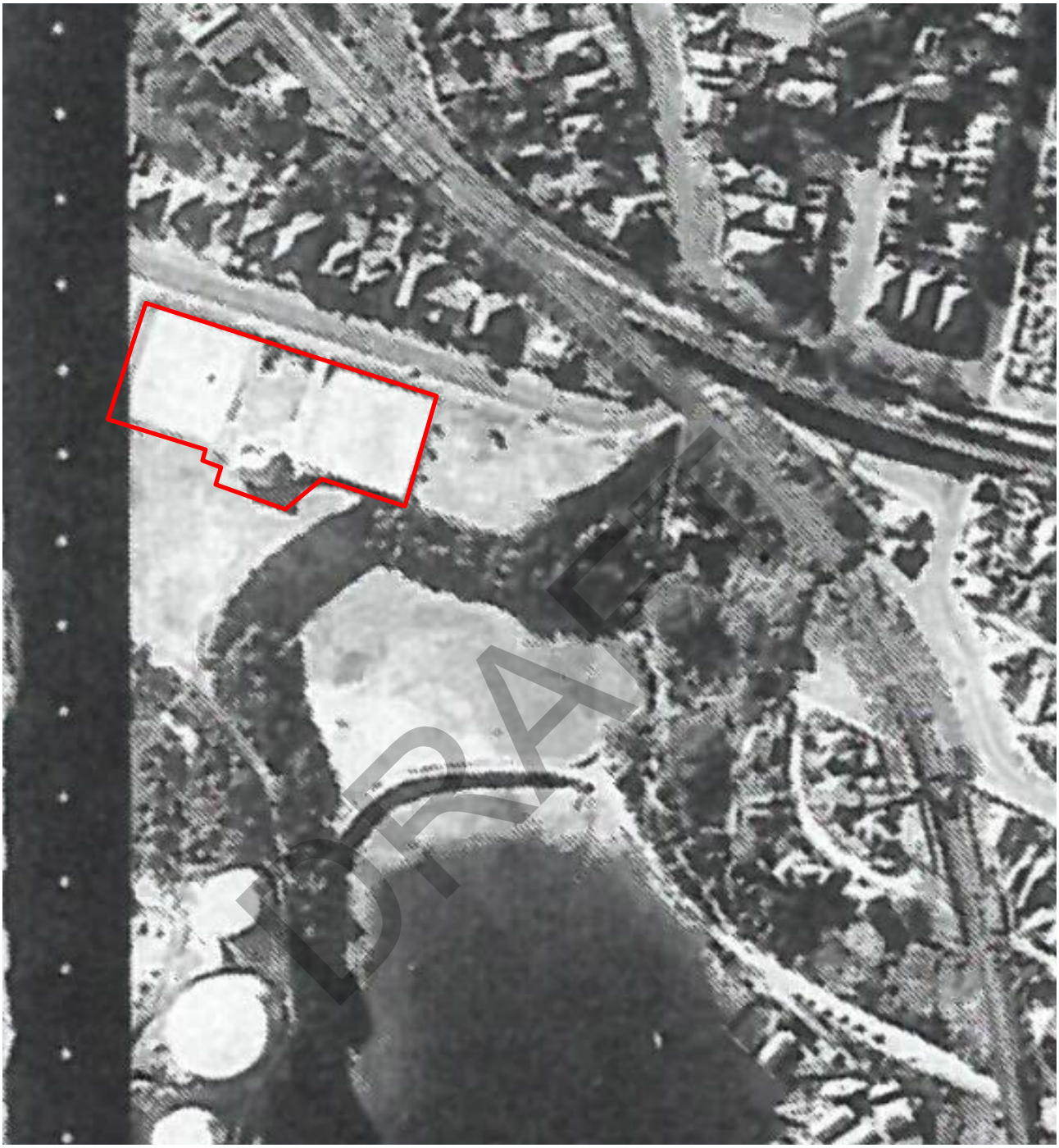
21. View of the interior of the club house building. A bowls club honour board observed during the inspection indicated the club was founded in 1947.

APPENDIX B

Aerial Photographs

1943 (source: SIX Maps)

1951 (source: LPI)



1961 (source: LPI)

1972 (source: LPI)

1982 (source: LPI)

1991 (source: LPI)

1999 (source: LPI)

2009 (source: Nearmap)

2015 (source: Nearmap)

2019 (source: Nearmap)

APPENDIX C

Land Titles Search Results

LAND REGISTRY SERVICES

Title Search

V.J. Ralph & Co Est. 1910 Searchlink City Legal Services

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 1205/752067

SEARCH DATE	TIME	EDITION NO	DATE
7/8/2019	2:11 PM	-	-

CERTIFICATE OF TITLE HAS NOT ISSUED

LAND

LOT 1205 IN DEPOSITED PLAN 752067
AT WAVERTON
LOCAL GOVERNMENT AREA NORTH SYDNEY
PARISH OF WILLOUGHBY COUNTY OF CUMBERLAND
(FORMERLY KNOWN AS PORTION 1205)
TITLE DIAGRAM CROWN PLAN 9325.2030

FIRST SCHEDULE

THE STATE OF NEW SOUTH WALES (CA150575)

SECOND SCHEDULE (2 NOTIFICATIONS)

* 1 THE LAND IS A RESERVE WITHIN THE MEANING OF PART 5 OF THE CROWN LANDS ACT 1989 AND THERE ARE RESTRICTIONS ON TRANSFER AND OTHER DEALINGS IN THE LAND UNDER THAT ACT, WHICH MAY REQUIRE CONSENT OF THE MINISTER.
* 2 LIMITED TITLE. LIMITATION PURSUANT TO SECTION 28T(4) OF THE REAL PROPERTY ACT, 1900. THE BOUNDARIES OF THE LAND COMPRISED HEREIN HAVE NOT BEEN INVESTIGATED BY THE REGISTRAR GENERAL.

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

New South Wales Land Registry > Prior Title Search

NSW: Prior Title Search - 1205/752067

Prior Title
CROWN LAND

This information is provided as a searching aid only. The Registrar General does not guarantee the information provided.

Received: 07/08/2019 14:14:28

PLAN OF PORTION 1205

PARISH WILLOUGHBY
LAND DISTRICT METROPOLITAN

COUNTY CUMBERLAND
~~SHIRE~~ MUNICIPALITY OF NORTH SYDNEY

A294

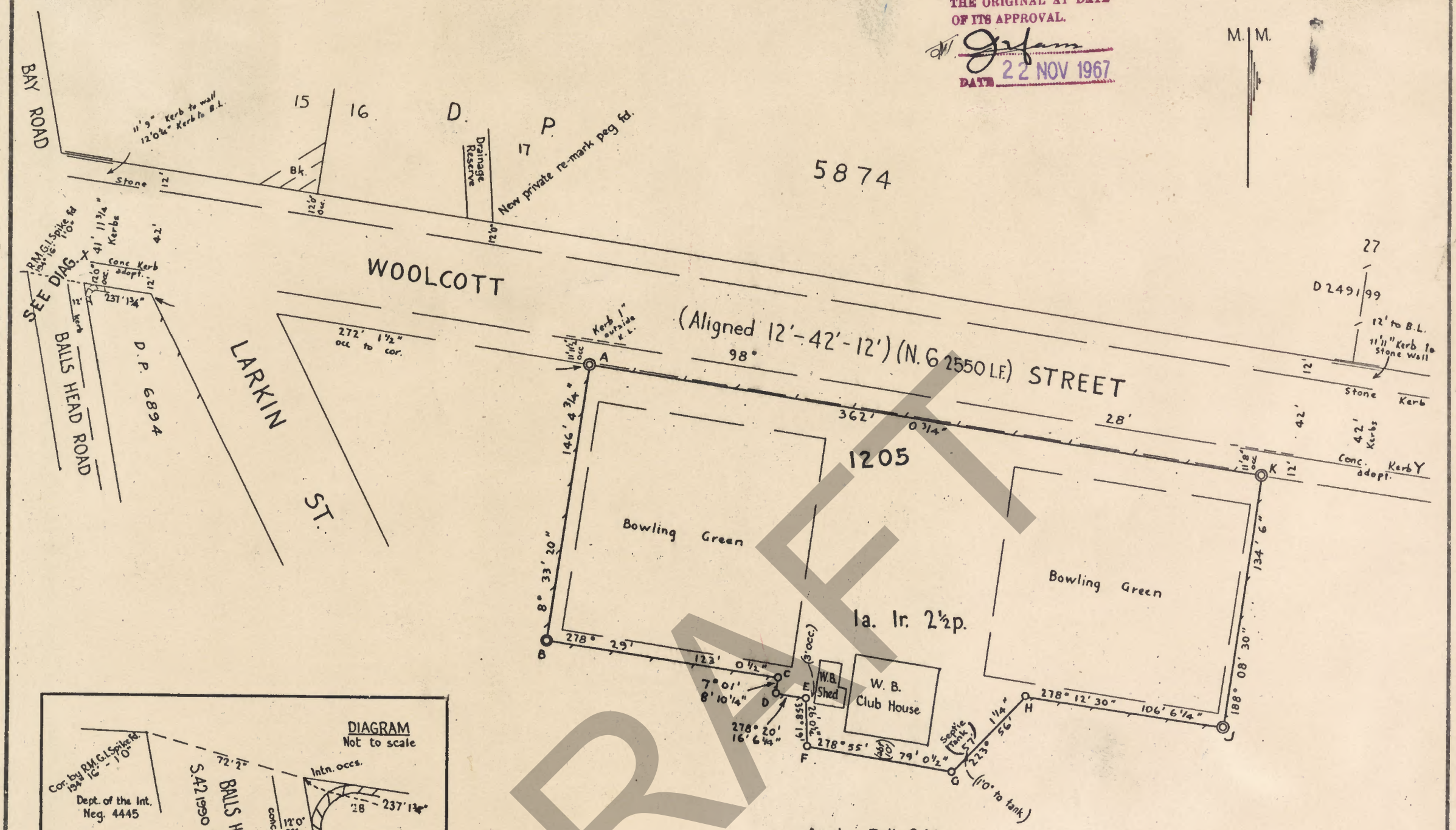
NOTATION PLAN.

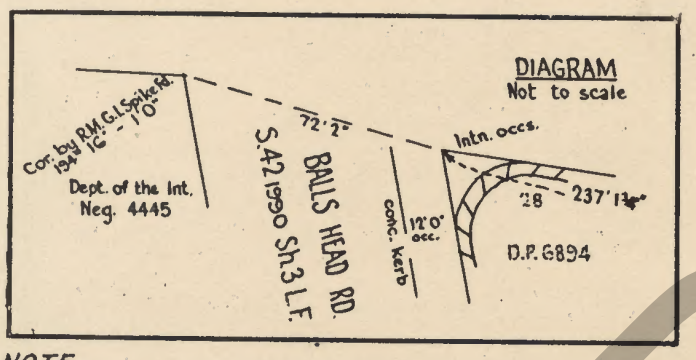
I, the Officer-in-Charge, General Drafting Branch, CERTIFY that this notation plan is PHOTOGRAPHIC COPY OF THE ORIGINAL AT DATE OF ITS APPROVAL.

DATE 22 NOV 1967

M. M.

5874





Appln. Roll 242

NOTE.
All fences shown on plan are 3 foot high wire mesh on pipe uprights

Surround Area : 55230 sq. ft.

SCALE 60 FEET TO AN INCH. All measurements shown in Feet

Cancels parts plans Ms. 2670 Sy. & Ms. 10414 Sy. R
Within : ~~Area dedicated for public recreation Gaz. 12th November, 1943 (Pt. Waverton Park)~~ revoked 15-9-1967 R. 2716 from occupation under any Miner's Right or Business License, notified 28th October, 1960
Por. 1205 : Sp. L. 61-110 Trustees of Waverton Bowling and Recreation Club
Title limited to the surface and to a depth of 50 feet below the surface

REFERENCE MARKS.

CORNER	BEARING	FROM	DISTANCE	NO. ON TREE
A	188° 50'	D.H&W. in Kerb	11' 9"	1205
~~B~~	~~98° 40'~~	~~D.H&W. in Conc.~~	~~24' 4¾"~~	~~1205~~
A	∠ Cut on	Iron Post		
B	98° 40'	D.H&W. in Conc.	24' 4¾"	1205
B	∠ Cut on	Iron Post		
C	∠ Cut on	Iron Post		
D	∠ Cut on	Iron Post		
E	∠ Cut on	Iron Post		
F	↑ Peg			1205
G	↑ Peg			1205
H	∠ Cut on	Iron Post		
J	277° 24'	G.I.P.	4' 0"	1205
K	∠ Cut on	Iron Post		
K	188° 46'	D.H&W. in Kerb on corner	11' 9"	1205

AZIMUTH TAKEN FROM XY
FIELD BOOK 4400 PAGES 30.

I David Johnson of Sydney
a Surveyor registered under the Surveyors Act, 1929-1946, hereby certify that the survey represented in this plan is accurate and has been made by me ~~under my immediate supervision~~ in accordance with the Survey Practice Regulations, 1933, and the special requirements of the Department of Lands and was completed on 1st. Aug. 1966

Signature David Johnson
Surveyor registered under the Surveyors Act, 1929-1946.
CHECKED & CHARTED C. Morgan 28th September, 1967
PLAN APPROVED J. K. Carey
Authorised Officer 12:10:1967

This space for office use only.

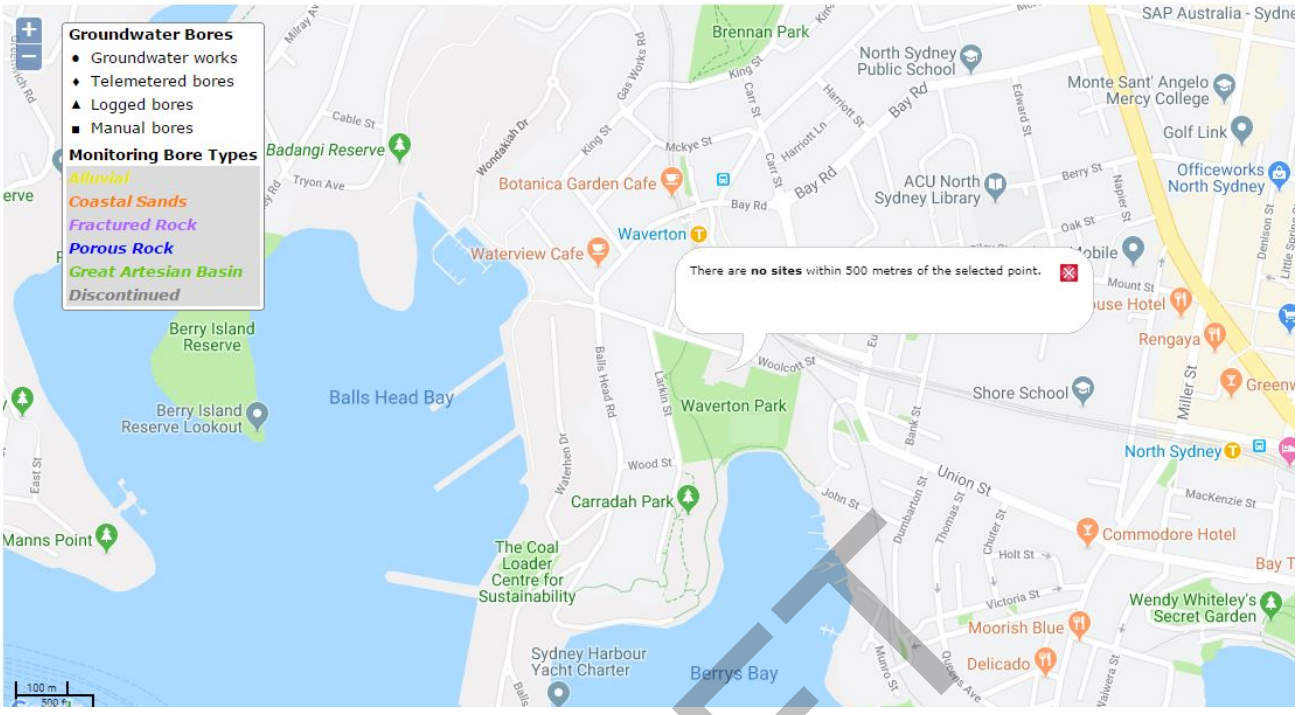
NOTATION PLAN

PAPER NO. LB 61-2069 TEN. 65-2256 CAT. NO. C.9325 2030

NOTATION PLAN

APPENDIX D

Groundwater Bore Search Results


Groundwater Bores
Groundwater works
Telemetered bores
Logged bores
Manual bores
Monitoring Bore Types
Alluvial
Coastal Sands
Fractured Rock
Porous Rock
Great Artesian Basin
Discontinued
There are no sites within 500 metres of the selected point.
Brennan Park
North Sydney Public School
Monte Sant' Angelo Mercy College
Golf Link
Officeworks North Sydney
Badangi Reserve
Botanica Garden Cafe
ACU North Sydney Library
Waverton
Waterview Cafe
Berry Island Reserve
Berry Island Reserve Lookout
Balls Head Bay
Waverton Park
Shore School
Rengaya
North Sydney
Carradah Park
Commodore Hotel
Manns Point
The Coal Loader Centre for Sustainability
Wendy Whiteley's Secret Garden
Moorish Blue
Delicado
Sydney Harbour Yacht Charter
Berrys Bay
Union St
Woolcott St
Wood St
John St
Holt St
Victoria St
MacKenzie St
Miller St
Bay Rd
Berry St
Oak St
Mount St
Napier St
Edward St
Harriott St
Carr St
King St
Mckye St
Cable St
Tryon Ave
Wondakiah Dr
Balls Head Rd
Larkin St
Waterhen Dr
Bank St
Dumbarton St
Thomas St
Chuter St
Munro St
Queens Ave
Denison St
100 m
500 ft

APPENDIX E

EPA Register Search Results

CLM ACT RECORD OF NOTICES SEARCH RESULTS

Search results

Your search for: LGA: North Sydney Council

Matched 17 notices relating to 5 sites.

Search Again Refine Search

Suburb	Address	Site Name	Notices related to this site
CAMMERAY	Brothers AVENUE	Tunks Park	3 former
NORTH SYDNEY	High STREET	HMAS Platypus Neutral Bay	1 current
NORTH SYDNEY	Adjacent to HMAS Platypus, 118 High STREET	Neutral Bay Sediments	2 former
WAVERTON	2 King STREET	Oyster Cove AGL	1 current and 7 former
WAVERTON	95 Bay ROAD	SRA Land	3 former

Page 1 of 1

6 August 2019

NOTIFICATIONS UNDER SECTION 60 OF THE CLM ACT SEARCH RESULTS

Suburb	SiteName	Address	ContaminationActivityType	ManagementClass	Latitude	Longitude
WAVERTON	SRA Land	95 Bay ROAD	Unclassified	Contamination formerly regulated under the CLM Act	-33.83716728	151.1969497
WAVERTON	Berry's Bay Woodley's Marina	1 Balls Head DRIVE	Other Industry	Contamination formerly regulated under the POEO Act	-33.84441851	151.1947433
WAVERTON	Oyster Cove AGL	2 King STREET	Gasworks	Ongoing maintenance required to manage residual contamination (CLM Act)	-33.83637995	151.193541
NORTH SYDNEY	Iora Complex	1 Kiara PLACE	Gasworks	Regulation under CLM Act not required	-33.843145	151.2161142
NORTH SYDNEY	Neutral Bay Sediments	Adjacent to HMAS Platypus, 118 High STREET	Gasworks	Contamination formerly regulated under the CLM Act	-33.842724	151.2174523
NORTH SYDNEY	HMAS Platypus Neutral Bay	High STREET	Gasworks	Contamination currently regulated under CLM Act	-33.84325935	151.2170347

POEO ACT ENVIRONMENT PROTECTION LICENCE SEARCH RESULTS

Your search for: **POEO Licences** with the following criteria

Suburb - waverton
returned 1 results

Export to excel 1 of 1 Pages Search Again

Number	Name	Location	Type	Status	Issued date
6322	WOODLEYS (BERRYS BAY) PTY LIMITED	1 BALLS HEAD ROAD, WAVERTON, NSW 2060	POEO licence	Surrendered	03 Apr 2000

06 August 2019

Your search for: **POEO Licences** with the following criteria

Suburb - mcmahons point
returned 1 results

Export to excel 1 of 1 Pages Search Again

Number	Name	Location	Type	Status	Issued date
10893	NOAKES BOAT & SHIPYARDS PTY LIMITED	6 JOHN STREET, MCMAHONS POINT, NSW 2060	POEO licence	Issued	14 Feb 2001

07 August 2019

Your search for: **POEO Licences** with the following criteria

Suburb - North Sydney
returned 4 results

Export to excel 1 of 1 Pages Search Again

Number	Name	Location	Type	Status	Issued date
12790	COGENT ENERGY PTY LTD	101-103 Miller Street, NORTH SYDNEY, NSW 2060	POEO licence	Issued	08 Jul 2008
6201	DARKROW PTY LTD	6 HOLT STREET, NORTH SYDNEY, NSW 2060	POEO licence	Surrendered	19 Jan 2000
6600	ST VINCENTS & MATER HEALTH SYDNEY LIMITED	25 - 35 ROCKLANDS ROAD, NORTH SYDNEY, NSW 2060	POEO licence	No longer in force	19 May 2000
4062	SYDNEY HARBOUR TUNNEL COMPANY LTD	130 MOUNT STREET, NORTH SYDNEY, NSW 2060	POEO licence	Issued	25 Jul 2000

06 August 2019

Search results

Your search for: **POEO Licences** with the following criteria

Suburb - Wollstonecraft
returned 0 results

Search Again

PENALTY NOTICE SEARCH RESULTS

Notice summary

Search Again | Return to Previous Page

Summary of Notice No: 3085780271

Organisation:	NOAKES BOAT & SHIPYARDS PTY LIMITED
Location:	NOAKES BOATYARD 6 JOHN STREET, MCMAHONS POINT, NSW, 2060
LGA:	NORTH SYDNEY
Catchment:	Sydney Coast & Georges River
Issue date:	19 Sep 2016 Penalty Notice
Offence date:	16 Aug 2016
Legislation:	Protection of the Environment Operations Act 1997 - 120(1)
Offence short title:	Pollute waters - other officer - Corporation

Licence

Number	Name	Licence status
10893	NOAKES BOAT & SHIPYARDS PTY LIMITED	Issued

APPENDIX F

Section 10.7 Planning Certificate

N O R T H S Y D N E Y C O U N C I L

address 200 Miller Street North Sydney NSW 2060
all correspondence General Manager North Sydney Council
PO Box 12 North Sydney NSW 2059
DX10587

telephone (02) 9936 8100
facsimile (02) 9936 8177
email council@northsydney.nsw.gov.au
internet www.northsydney.nsw.gov.au
ABN 32 353 260 317

Applicant:
Shane Doyle
Golder Associates Pty Ltd
PO Box 1302
Crows Nest 1585

PLANNING CERTIFICATE UNDER SECTION 10.7 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Cert. No.: **73897/02**
Page No.: **1 of 8**

Parcel No: 17354

Date: 07/08/2019
Receipt No.: 2318900
Your REF: 19126714

Property Description:
Woolcott Street WAVERTON NSW 2060
LOT: 1205 DP: 752067

Owner (as recorded by council):
The North Sydney Club Ltd
PO Box 825
NORTH SYDNEY NSW 2059

The Title information shown on this Certificate has been obtained from the Land and Property Information NSW, therefore Council cannot guarantee accuracy.

The information required to be disclosed in this planning certificate is that prescribed by Schedule 4 of the Environmental Planning and Assessment Regulation 2000. If no response is provided in this planning certificate for an item listed in Schedule 4, that matter has been considered and determined as not applying to the land to which this certificate relates.

AS AT THE DATE OF THE CERTIFICATE THE FOLLOWING MATTERS APPLY TO THE ABOVE MENTIONED LAND.

PLANNING INSTRUMENT:

North Sydney Local Environmental Plan 2013, published on the NSW legislation website on 2 August 2013 and came into force on 13 September 2013, as amended.

Zone: RE1 – Public Recreation
Permitted without consent
Environmental protection works
Permitted with consent
Aquaculture; Building identification signs; Business identification signs; Community facilities; Environmental facilities; Information and educational facilities; Kiosks; Recreation areas; Recreational facilities (outdoor); Restaurants or cafes; Roads; Water recreation structures
Prohibited
Any development, other than a development specified above, is prohibited in the zone

Exempt Development
Development for the purposes set out in clause 3.1 of *North Sydney Local Environmental Plan 2013* is exempt development, which may be carried out within the zone without the need for development consent.

Complying Development

N O R T H S Y D N E Y C O U N C I L

address 200 Miller Street North Sydney NSW 2060
all correspondence General Manager North Sydney Council
PO Box 12 North Sydney NSW 2059
DX10587

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internet www.northsydney.nsw.gov.au
ABN 32 353 260 317

Development for the purposes set out in clause 3.2 of *North Sydney Local Environmental Plan 2013* is complying development, which may be carried out within the zone without the need for development consent, provided that a complying development certificate is obtained.

Development Consent MAY BE REQUIRED for the DEMOLITION of all or part of any building on the subject land under *North Sydney Local Environmental Plan 2013*. Refer to *SEPP (Exempt and Complying Development Codes) 2008* and Clause 3.1 under *North Sydney Local Environmental Plan 2013*.

DRAFT PLANNING INSTRUMENTS:

Planning Proposal 7/15 to amend North Sydney Local Environmental Plan 2013 – 575-583 Pacific Highway, St Leonards

This Planning Proposal seeks to amend the planning controls to *North Sydney Local Environmental Plan 2013* for land at 575-583 Pacific Highway, St Leonards. In particular, the proposed amendments include:

- increasing the maximum building height from 26m to 56m; and
- applying a whole of site maximum Floor Space Ratio of 7:1.

Accompanying the Planning Proposal is a draft Voluntary Planning Agreement (VPA) that proposes a monetary contribution of $4,095,803 to assist Council in providing public open space in the area as envisaged by the *St Leonards/Crows Nest Planning Study for Precinct 1.*

The Planning Proposal and VPA will be on public exhibition from Thursday 8 March 2018 to Thursday 12 April 2018.

Planning Proposal 6/16 to amend North Sydney Local Environmental Plan 2013 – 100 Christie Street, St Leonards

This Planning Proposal seeks to amend the planning controls to *North Sydney Local Environmental Plan 2013* for land at 100 Christie Street, St Leonards. In particular, the proposed amendments include:

- increasing the maximum building height from 49m to 132m;
- introducing a maximum floor space ratio (FSR) of 18:1;
- introducing a minimum non-residential FSR of 4.25:1;
- adding a clause to Schedule 1 – *Additional Permitted Uses* such that "shop top housing" is permissible with consent on the subject site;
- adding a clause to Part 6 – *Local Provisions* such that basement parking may be constructed under 50% of the lot containing Christie Street Reserve; and
- amending Clause 4.6 to exclude the use of Clause 4.6 to vary the development standard proposed above under Part 6.

Accompanying the Planning Proposal is a draft Voluntary Planning Agreement (VPA) which seeks to provide Council with a material public benefit in the form of two floors of co-working commercial office space within the building podium, embellishment and dedication of the Christie Street Reserve to Council in perpetuity, upgrade of Chandos Street and Sergeants Lane and a monetary contribution of $100,000 to Council for the purpose of a bike hub in the area.

The Planning Proposal and VPA will be on public exhibition from Thursday 8 November 2018 to Thursday 6 December 2018.

Planning Proposal 1/18 to amend North Sydney Local Environmental Plan 2013 – 23 – 35 Atchison Street, St Leonards

N O R T H S Y D N E Y C O U N C I L

address 200 Miller Street North Sydney NSW 2060
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internet www.northsydney.nsw.gov.au
ABN 32 353 260 317

The Planning Proposal seeks to amend *North Sydney Local Environmental Plan 2013* to amend the planning controls for land at 23-35 Atchison Street, St Leonards. In particular, the proposed amendments include:

- increasing the maximum building height from 20m to 56m (equivalent to 16 storeys);
- increasing the minimum non-residential floor space ratio from 0.6:1 to 1.5:1; and
- imposing a maximum floor space ratio of 6.3:1

Accompanying the Planning Proposal is a draft Voluntary Planning Agreement (VPA) that proposes the dedication of a 5-metre wide strip for the purpose of a linear park along Oxley Street, the provision of a publically accessible 6-metre wide laneway from Atchison Street to Albany Lane along the western boundary of the site, and a monetary contribution of $2,800,000 towards the upgrade of Hume Street Park or public open space within the North Sydney Local Government Area.

In addition, Council resolved to place an associated draft amendment to *North Sydney Development Control Plan 2013* (NSDCP 2013) on public exhibition concurrently with the Planning Proposal that seeks to introduce a 6m ground level setback control along the Atchison Street portion of the site.

The Planning Proposal, VPA and associated draft DCP amendment will be on public exhibition from Thursday 4 April 2019 to Thursday 2 May 2019.

DEVELOPMENT CONTROL PLANS:

North Sydney Development Control Plan 2013
North Sydney Development Control Plan 2013 applies to all land to which *North Sydney Local Environmental Plan 2013* applies. The Development Control Plan was adopted by Council on 2 September 2013 and came into effect on 13 September 2013. Amended 20/02/14. Amended 08/01/2015. Amended 26/03/2015. Amended 6/08/2015. Amended 5/11/2015. Amended 7/07/2016. Amended 13/10/2016. Amended 19/07/2017. Amended 16/11/2017. Amended 7/12/2017. Amended 15/03/2018.

INFRASTRUCTURE CONTRIBUTION PLANS:

North Sydney Section 94 Contributions Plan. Local infrastructure contributions plan made under Section 7.11 of the Environmental Planning and Assessment Act 1979, applying to all development in the North Sydney local government area. Effective from 20 June 2013.

HERITAGE CONTROLS:

The subject land IS NOT WITHIN A CONSERVATION AREA, under clause 5.10 - Heritage Conservation to *North Sydney Local Environmental Plan 2013*.

The subject land IS NOT identified as containing A HERITAGE ITEM, under clause 5.10 - Heritage Conservation to *North Sydney Local Environmental Plan 2013*.

The subject land IS NOT identified as containing a HERITAGE ITEM under *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005.*

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ABN 32 353 260 317

OTHER CONTROLS:

The subject land IS AFFECTED by *State Environmental Planning Policy (Coastal Management) 2018*. The Plan identifies the subject land as being located within one or more of the following areas:

- Wholly within the *Coastal Environment Area*
- Wholly within the *Coastal Use Area*

The subject land is NOT PROCLAIMED as a MINE SUBSIDENCE DISTRICT within the meaning of Section 15 of the *Mine Subsidence Compensation Act 1961*.

The subject land is NOT AFFECTED by any ROAD WIDENING OR ROAD REALIGNMENT under the *Roads Act 1993*.

The subject land is NOT AFFECTED by any ROAD WIDENING OR ROAD REALIGNMENT under any environmental planning instrument.

The subject land is NOT AFFECTED by any ROAD WIDENING OR ROAD REALIGNMENT under any Council resolution.

The subject land is NOT IDENTIFIED as BUSHFIRE PRONE LAND on Council's Bushfire Prone Land Map as certified by the NSW Rural Fire Service Commissioner dated 22 June 2018 pursuant to the requirements under the of the *Rural Fires Act 1997* and *Environmental Planning and Assessment Act 1979*.

The subject land is NOT SUBJECT to any reservation for LAND ACQUISITION by a public authority for any purpose under any environmental planning instrument applying to the land as set out in this certificate.

Council is NOT AWARE of the subject land being subject to an ORDER issued under the *Trees (Disputes Between Neighbours) Act 2006*.

The subject land IS AFFECTED by *Sydney Harbour Regional Environmental Plan (Sydney Harbour Catchment) 2005*. The Plan identifies the whole or part of the subject land as being located within one or more of the following:

- *Foreshores and Waterways Area*
- a zone under the *Zoning Map*
- a *Wetland Protection Area*
- *Sydney Opera House Buffer Zone*

or comprising one or more of the following:

- a *Strategic Foreshore Site*
- a *Heritage Item*

Loose-fill Asbestos Insulation

Council has no record of the subject land being identified on the NSW Fair Trading's *Loose-Fill Asbestos Insulation Register* as containing a residential building containing loose-fill asbestos insulation, (sometimes called "Mr Fluffy" insulation). Loose-fill asbestos is easy to disturb and can become airborne and it is then easily inhaled. Inhaling asbestos fibres can result in serious illness including asbestosis, lung cancer and mesothelioma.

You are advised to contact NSW Fair Trading for more information:
https://www.fairtrading.nsw.gov.au/housing-and-property/loose-fill-asbestos-insulation

NORTH SYDNEY COUNCIL

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Note: Nothing in this statement relates to information about the presence of bonded asbestos materials such as asbestos cement sheeting which may have been used at this site.

Council is not aware of any *Affected Building Notice*, *Building Product Rectification Order* or *Intention to make a Building Product Rectification Order* made under the *Building Products (Safety) Act 2017* applying to the subject land.

The subject land is NOT AFFECTED by a policy, adopted by the Council or adopted by any other public authority and notified to the Council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the Council, that restricts the development of the land by reason of the likelihood of landslip, bushfire, flooding, tidal inundation, subsidence, acid sulphate soils or any other risk.

THE FOLLOWING STATE ENVIRONMENTAL PLANNING POLICIES AND REGIONAL ENVIRONMENTAL PLANS APPLY:

State Environmental Planning Policies (SEPPs)
SEPP No. 1 – Development Standards
SEPP No. 19 - Bushland in urban areas
SEPP No. 33 - Hazardous and offensive development
SEPP No. 50 - Canal estate development
SEPP No. 55 - Remediation of land
SEPP No. 64 - Advertising and signage
SEPP No. 65 - Design Quality of Residential Apartment Development
SEPP No. 70 – Affordable Housing (Revised Schemes)
SEPP (Affordable Rental Housing) 2009
SEPP (Building Sustainability Index: BASIX) 2004
SEPP (Coastal Management) 2018 *(land wholly affected)*
SEPP (Concurrences) 2018
SEPP (Educational Establishments & Child Care Facilities) 2017
SEPP (Exempt and Complying Development Codes) 2008
SEPP (Housing for Seniors or People with a Disability) 2004 - *formerly SEPP (Seniors Living) 2004*
SEPP (Infrastructure) 2007
SEPP (Primary Production and Rural Development) 2019
SEPP (State Significant Precincts) 2005 - formerly SEPP Major Development, SEPP Major Projects & SEPP State Significant Development
SEPP (Mining, Petroleum Production and Extractive Industries) 2007
SEPP (Miscellaneous Consent Provisions) 2007 - *formerly SEPP (Temporary Structures) 2007*
SEPP (State and Regional Development) 2011
SEPP (Vegetation in Non-Rural Areas) 2017

Regional Environmental Plans (REPs) (Deemed SEPPs)
Sydney REP (Sydney Harbour Catchment) 2005

Note: summaries of the SEPPs and deemed SEPPs are provided on the Department of Planning's website at: www.planning.nsw.gov.au

Draft State Environmental Planning Policies (SEPPs)
Draft SEPP No. 66 - Integration of Land Use and Transport
Draft SEPP (Application of Development Standards) 2004
Draft SEPP (Competition) 2010
Draft SEPP (Environment) 2017

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Draft SEPP (Remediation of Land) 2018

Note: summaries of the draft SEPPs are provided on the Department of Planning's website at:
www.planning.nsw.gov.au

FOR THE PURPOSE OF SECTION 10.7(2) AND CLAUSE 3 TO SCHEDULE 4 OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT REGULATION 2000, THE FOLLOWING INFORMATION IS PROVIDED:

Rural Housing Code
Complying development types specified within the Rural Housing Code under Part 3A of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* CAN BE UNDERTAKEN ON THE SUBJECT LAND.

Housing Alterations Code
Complying development types specified within the Housing Alterations Code under Part 4 *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* CAN BE UNDERTAKEN ON THE SUBJECT LAND.

General Development Code
Complying development types specified within the General Development Code under Part 4A *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* CAN BE UNDERTAKEN ON THE SUBJECT LAND.

Commercial and Industrial Alterations Code
Complying development types specified within the Commercial and Industrial Alterations Code under Part 5 of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* CAN BE UNDERTAKEN ON THE SUBJECT LAND.

Commercial and Industrial (New Buildings and Additions) Code
Complying development types specified within the Commercial and Industrial (New Buildings and Additions) Code under Part 5A of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* CAN BE UNDERTAKEN ON THE SUBJECT LAND.

Subdivisions Code
Complying development types specified within the Subdivisions Code under Part 6 of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* CAN BE UNDERTAKEN ON THE SUBJECT LAND.

Demolition Code
Complying development types specified within the Demolition Code under Part 7 of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* CAN BE UNDERTAKEN ON THE SUBJECT LAND.

Fire Safety Code

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address 200 Miller Street North Sydney NSW 2060
all correspondence General Manager North Sydney Council
PO Box 12 North Sydney NSW 2059
DX10587

telephone (02) 9936 8100
facsimile (02) 9936 8177
email council@northsydney.nsw.gov.au
internet www.northsydney.nsw.gov.au
ABN 32 353 260 317

Complying development types specified within the Fire Safety Code under Part 8 of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* CAN BE UNDERTAKEN ON THE SUBJECT LAND.

Container Recycling Facilities Code
Complying development types specified within the Container Recycling Facilities Code under Part 5B of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* CAN BE UNDERTAKEN ON THE SUBJECT LAND.

Low Rise Medium Density Housing Code
Complying development types specified within the Low Rise Medium Density Housing Code under Part 3B of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* CAN BE UNDERTAKEN ON THE SUBJECT LAND.

Greenfield Housing Code
Complying development types specified within the Greenfield Housing Code under Part 3C of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* CAN BE UNDERTAKEN ON THE SUBJECT LAND.

Note. This part of the Planning Certificate only addresses matters raised in Clauses 1.17A(c)-(e), (2), (3) and (4), 1.18 (1)(c3) and 1.19 of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.* It is your responsibility to ensure that you comply with any other relevant requirements of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.* Failure to comply with these provisions may mean that a Complying Development Certificate issued under the provisions of the *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* is invalid.

Housing Code
Complying development types specified within the Housing Code under Part 3 of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* CAN BE UNDERTAKEN ON THE SUBJECT LAND.

FOR THE PURPOSE OF SECTION 59(2) OF THE CONTAMINATED LAND MANAGEMENT ACT 1997, THE FOLLOWING INFORMATION IS PROVIDED:

Council is NOT AWARE of the land (or part of the land) being declared SIGNIFICANTLY CONTAMINATED land, as defined under Section 11 of the *Contaminated Land Management Act, 1997*.

Council is NOT AWARE of the land (or part of the land) being subject to a management order, as defined under Section 14(1) of the *Contaminated Land Management Act, 1997*.

Council is NOT AWARE of the land (or part of the land) being the subject of an approved voluntary management proposal, as defined under Section 17(1) of the *Contaminated Land Management Act, 1997*.

Council is NOT AWARE of the land (or part of the land) being subject to an ongoing maintenance order, as defined under Section 28(2) of the *Contaminated Land Management Act, 1997*.

Council is NOT AWARE of the land (or part of the land) being the subject of a site audit statement, as defined under Part 4 of the *Contaminated Land Management Act, 1997*.

FOR THE PURPOSE OF SECTION 10.7(5) THE FOLLOWING INFORMATION IS PROVIDED:

The subject land IS NOT LISTED in the Register of the National Trust of NSW.

NORTH SYDNEY COUNCIL

address 200 Miller Street North Sydney NSW 2060
all correspondence General Manager North Sydney Council
PO Box 12 North Sydney NSW 2059
DX10587

telephone (02) 9936 8100
facsimile (02) 9936 8177
email council@northsydney.nsw.gov.au
internet www.northsydney.nsw.gov.au
ABN 32 353 260 317

The subject land is NOT AFFECTED by the *HERITAGE ACT, 1977.*

A Tree Preservation Order applies throughout the North Sydney Council area. Contact Council for details.

Information regarding loose-fill asbestos insulation
NSW Fair Trading have identified that some residential buildings in the North Sydney LGA may contain loose-fill asbestos insulation (sometimes called "Mr Fluffy" insulation), for example in the roof space of the building. Loose-fill asbestos is easy to disturb and can become airborne and it is then easily inhaled. Inhaling asbestos fibres can result in serious illness including asbestosis, lung cancer and mesothelioma. The use of loose-fill asbestos insulation was banned in 1980.

NSW Fair Trading maintains a Register of homes that are affected by loose-fill asbestos insulation.

You should make your own enquiries as to the age of the buildings on the land to which this certificate relates and, if it contains a building constructed prior to 1980, Council strongly recommends that any potential purchaser obtain advice from a licensed asbestos assessor to determine whether loose-fill asbestos is present in any building on the land and, if so, the health risks (if any) this may pose for the building's occupants.

Contact NSW Fair Trading for further information as follows: https://www.fairtrading.nsw.gov.au/housing-and-property/loose-fill-asbestos-insulation.

Note: Nothing in this statement relates to information about the presence of bonded asbestos materials such as asbestos cement sheeting which may have been used at this site.

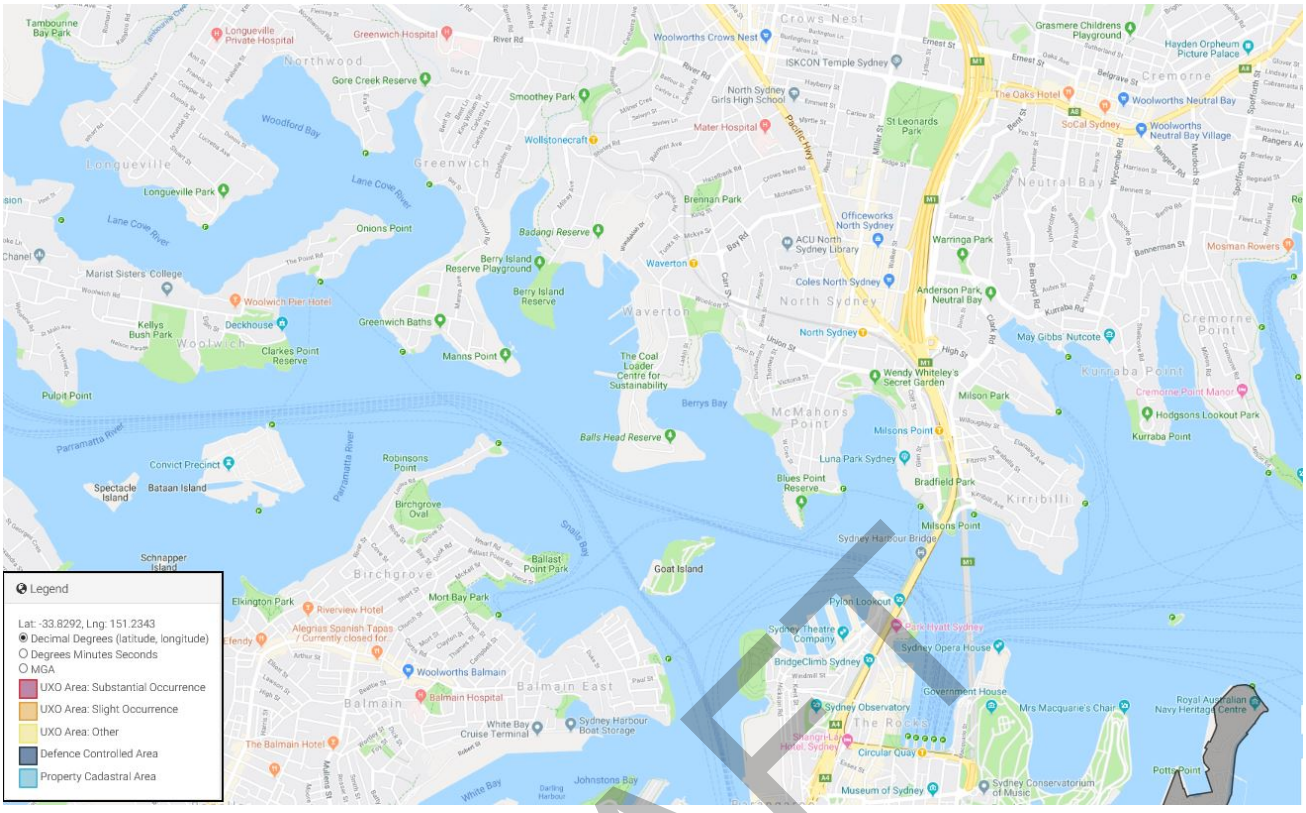
FLOODING INFORMATION:
Council is in the possession of a flood study that covers the catchment in which this subject land is located. The *North Sydney LGA Flood Study* (prepared by WMA Water and dated February 2017) was adopted by Council on 20 February 2017. The *Flood Study* does not establish any flood related development controls, which are to be determined at the completion of the North Sydney Floodplain Risk Management Study and Plan. You should make you own enquiries as to whether the subject land to which this Certificate relates is affected by flooding and overland flow. Copies of the Flood Study are available for inspection at the Council if required.

For further information, please contact Council's
DIVISION OF CITY STRATEGY

KEN GOULDTHORP
GENERAL MANAGER
Electronically generated certificate – no signature required

APPENDIX G

Defence UXO Records Search Results


Legend
Lat: -33.8292, Lng: 151.2343
Decimal Degrees (latitude, longitude)
Degrees Minutes Seconds
MGA
UXO Area: Substantial Occurrence
UXO Area: Slight Occurrence
UXO Area: Other
Defence Controlled Area
Property Cadastral Area

APPENDIX H

Borelogs

GOLDER

REPORT OF BOREHOLE: BH01

SHEET: 1 OF 1

CLIENT: North Sydney Council
PROJECT: Waverton Bowling Club
LOCATION: Woolcott Street, Waverton
JOB NO: 19126714

COORDS: 333219.0 m 6254165.0 m 56
SURFACE RL: DATUM: AHD
INCLINATION: -90°
HOLE DEPTH: 0.70 m

DRILL RIG: Hand Auger
CONTRACTOR:
LOGGED: TMPA DATE: 2/9/19
CHECKED: SPD DATE: 24/9/19

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA	M		0.0		BH01_0.1 0.10-0.20 m Rec = 100/100 mm QCA100 QCB100 R = 0A PID = 1.8 ppm				FILL: Silty SAND fine to medium grained, brown, low plasticity silt	M		
				0.40					: as above with granite boulders and cobbles (ballast)			
	H		0.5	*0.50*	BH01_0.5 0.50-0.60 m Rec = 100/100 mm R = 3A PID = 0.7 ppm				FILL: Sandy GRAVEL fine to coarse grained, sub-angular to angular, black, fine to coarse grained sand, porous, shiny and light (clinker)			
									END OF BOREHOLE @ 0.70 m REFUSAL BACKFILLED Refusal on large sandstone boulders			
			1.0									
			1.5									
			2.0									
			2.5									
			3.0									

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for geotechnical purposes only, without attempt to assess possible contamination. Any references to potential contamination are for information only and do not necessarily indicate the presence or absence of soil or groundwater contamination.

GAP gINT FN. F01a RL3

GOLDER

REPORT OF BOREHOLE: BH02

SHEET: 1 OF 1

CLIENT: North Sydney Council
PROJECT: Waverton Bowling Club
LOCATION: Woolcott Street, Waverton
JOB NO: 19126714

COORDS: 333232.0 m 6254131.0 m 56
SURFACE RL: DATUM: AHD
INCLINATION: -90°
HOLE DEPTH: 0.70 m

DRILL RIG: Hand Auger
CONTRACTOR:
LOGGED: TMPA DATE: 2/9/19
CHECKED: SPD DATE: 24/9/19

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA	M		0.0		BH02_0.1 0.10-0.20 m Rec = 100/100 mm R = 0A PID = 1.7 ppm				FILL: Silty SAND fine to medium grained, brown, low plasticity silt	M		
				0.40					: as above granite cobbles and boulders present (ballast)			
	H		0.5		BH02_0.5 0.50-0.60 m Rec = 100/100 mm R = 0A PID = 1.6 ppm							
									END OF BOREHOLE @ 0.70 m REFUSAL BACKFILLED Refusal on large sandstone boulders			
			1.0									
			1.5									
			2.0									
			2.5									
			3.0									

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for geotechnical purposes only, without attempt to assess possible contamination. Any references to potential contamination are for information only and do not necessarily indicate the presence or absence of soil or groundwater contamination.

GAP gINT FN. F01a
RL3

GOLDER

REPORT OF BOREHOLE: BH03

SHEET: 1 OF 1

CLIENT: North Sydney Council
PROJECT: Waverton Bowling Club
LOCATION: Woolcott Street, Waverton
JOB NO: 19126714

COORDS: 333263.0 m 6254141.0 m 56
SURFACE RL: DATUM: AHD
INCLINATION: -90°
HOLE DEPTH: 0.80 m

DRILL RIG: Hand Auger
CONTRACTOR:
LOGGED: TMPA DATE: 2/9/19
CHECKED: SPD DATE: 24/9/19

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA	L		0.0		BH03_0.1 0.10-0.20 m Rec = 100/100 mm R = 0A PID = 1.9 ppm				FILL: Silty SAND fine to medium grained, brown, low plasticity silt			roots present at 0.2m bgl
				0.30								
	H		0.5	0.40	BH03_0.5 0.50-0.60 m Rec = 100/100 mm R = 3A PID = 1.3 ppm				FILL: Gravelly SAND fine to coarse grained, yellow brown, fine to coarse grained, angular to subrounded (sandstone) gravel : as above with clay (orange/ grey), and trace clinker	M		pices of plastic and trace clinker present: 0.3m-0.8m bgl
				0.70					: as above brown, no clinker			
			1.0						END OF BOREHOLE @ 0.80 m REFUSAL BACKFILLED Refusal on large sandstone boulders			
			1.5									
			2.0									
			2.5									
			3.0									

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for geotechnical purposes only, without attempt to assess possible contamination. Any references to potential contamination are for information only and do not necessarily indicate the presence or absence of soil or groundwater contamination.

GAP gINT FN. F01a RL3

GOLDER

REPORT OF BOREHOLE: BH04

SHEET: 1 OF 1

CLIENT: North Sydney Council
PROJECT: Waverton Bowling Club
LOCATION: Woolcott Street, Waverton
JOB NO: 19126714

COORDS: 333284.0 m 6254142.0 m 56
SURFACE RL: DATUM: AHD
INCLINATION: -90°
HOLE DEPTH: 0.90 m

DRILL RIG: Hand Auger
CONTRACTOR:
LOGGED: TMPA DATE: 2/9/19
CHECKED: SPD DATE: 24/9/19

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA	M	▽	0.0		BH04_0.1 0.10-0.20 m Rec = 100/100 mm R = 0A PID = 1.3 ppm				FILL: Silty SAND fine to medium grained, brown, low plasticity silt	M		
				0.40								
			0.5	0.50	BH04_0.5 0.50-0.60 m Rec = 100/100 mm R = 0A PID = 1.3 ppm				FILL: SAND fine to medium grained, grey			
									FILL: Sandy GRAVEL fine to medium grained, angular to subrounded, black, fine to coarse grained sand, porous (clinker), no odour			
					BH04_0.8 0.80-0.90 m Rec = 100/100 mm R = 3A PID = 1.4 ppm					W		
			1.0						END OF BOREHOLE @ 0.90 m REFUSAL BACKFILLED Refusal on large sandstone boulders			
			1.5									
			2.0									
			2.5									
			3.0									

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for geotechnical purposes only, without attempt to assess possible contamination. Any references to potential contamination are for information only and do not necessarily indicate the presence or absence of soil or groundwater contamination.

GAP gINT FN. F01a RL3

GOLDER

REPORT OF BOREHOLE: BH05

SHEET: 1 OF 1

CLIENT: North Sydney Council
PROJECT: Waverton Bowling Club
LOCATION: Woolcott Street, Waverton
JOB NO: 19126714

COORDS: 333304.0 m 6254117.0 m 56
SURFACE RL: DATUM: AHD
INCLINATION: -90°
HOLE DEPTH: 0.95 m

DRILL RIG: Hand Auger
CONTRACTOR:
LOGGED: TMPA DATE: 2/9/19
CHECKED: SPD DATE: 24/9/19

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA	M	▽	0.0		BH05_0.1 0.10-0.20 m Rec = 100/100 mm R = 0A PID = 1 ppm				FILL: Silty SAND fine to medium grained, brown, low plasticity silt	M		
			0.5	0.50	BH05_0.5 0.50-0.60 m Rec = 100/100 mm R = 3A PID = 1.2 ppm				FILL: Sandy GRAVEL fine to medium grained, angular to subrounded, dark brown/ black, fine to coarse grained sand, porous (clinker)	W		Plastic film present at 0.5m bgl
					BH05_0.9 0.90-0.95 m Rec = 50/50 mm R = 3A PID = 0.7 ppm				END OF BOREHOLE @ 0.95 m REFUSAL BACKFILLED Refusal on large sandstone boulders			
			1.0									
			1.5									
			2.0									
			2.5									
			3.0									

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for geotechnical purposes only, without attempt to assess possible contamination. Any references to potential contamination are for information only and do not necessarily indicate the presence or absence of soil or groundwater contamination.

GAP gINT FN. F01a RL3

APPENDIX I

Laboratory Certificates

Sheet..... of.......

SAMPLE CHAIN OF CUSTODY DOCUMENTATION

Project No:	19126714	Lab Name:	ALS
Site Location:	Waverton Bowling Club	Quote No:	EN-002-18
Sampled By:	Theodore Adcock	Order No:	PO22402
Turnaround Time:	24hrs ☐ 48hrs ☐ Standard ■ 36hrs ☐ 5 Days ☐ Date Required By:		
Delivery Option:	HARD ☐ FAX ☐ DISK ☐ EMAIL ■ BULLETIN BOARD ☐		
Report Format:	PDF ■ EXCEL ■ ESDAT ■		

GOLDER ASSOCIATES PTY LTD
Phone: : (02) 9478 3900
Fax : (02) 9478 3901
Project Manager: Shane Doyle Phone: 0412 068 218 Email: SDoyle@golder.com.au
Job Contact : Theodore Adcock Phone: 0434 196 861 Email: Tadcock@golder.com.au

Comments/Special Instructions: Please send deliverables to SDoyle@golder.com.au, Tadcock@golder.com.au

Ship sample QCB100 to Envirolab Services for triplicate analysis

Subcon / Forward Lab / Analysis: Asbestos → Newcastle
Forwarded By / Date: QCB100 → Envirolab
Relinquished By / Date:
Connote / Courier:
No:
Batch By PO /

LAB ID	SAMPLE ID	SAMPLE TIME	SAMPLE DATE	SAMPLE TYPE	SAMPLE MATRIX	No CONTAINERS	Level of Contamination (Low/High/Unknown)	HOLD	TRH(C6-C40), BTEXN, HM*8, PHENOLS, OCP, OPP, PCB (ALS S-19)	SVOC (ALS EP075)	AMMONIA (ALS EK055)	FREE CYANIDE (ALS EK025)	ASBESTOS - NEPM (ALS EA200N)	ASBESTOS - PRESENCE/ABSENCE (ALS EA200B)	TRH(C6-40), BTEXN/HM*8/PAH (ALS W26)
1	BH01_0.1		2/09/2019		SOIL	2			X		X	X	X		
2	BH01_0.5		2/09/2019		SOIL	2		X							
3	BH02_0.1		2/09/2019		SOIL	2				X					
4	BH02_0.5		2/09/2019		SOIL	2			X		X	X			
5	BH03_0.1		2/09/2019		SOIL	2				X			X		
6	BH03_0.5		2/09/2019		SOIL	2					X	X			
7	BH04_0.1		2/09/2019		SOIL	2				X					
8	BH04_0.5		2/09/2019		SOIL	2			X						
9	BH04_0.8		2/09/2019		SOIL	2				X	X	X			
10	BH05_0.1		2/09/2019		SOIL	2			X				X		
11	BH05_0.5		2/09/2019		SOIL	2		X							
12	BH05_0.9		2/09/2019		SOIL	2				X	X	X			
13	Trans01		2/09/2019		SOIL	2			X				X		
14	ASB01		2/09/2019		ACM	1		X						X	
15															
16	QCA100		2/09/2019		SOIL	2			X		X	X			
–	QCB100		2/09/2019		SOIL	2		X	Send sample to Envirolab Services for triplicate analyis						
17	RB		2/09/2019		WATER	4									X
18	TB														
19	TS														
20	TS C														
Extra 21	[illegible]														

Environmental Division
Sydney
Work Order Reference
ES1928334
Telephone : + 61-2-8784 8555

SAMPLE MATRIX = Soil/Sediment/Fill/Water/Other SAMPLE TYPE = Composite(C)/Discrete(DC)/Disturbed(DS)/Core(CR), Grab Sample (GS) HIGH CONCENTRATION: circle expected parameters in analysis list

	SIGNATURE	COMPANY	DATE	TIME
RELEASED BY	Theodore Adcock	Golder Associates	3/09/2019	
RECEIVED BY	[signature]	ALS	4/9/19	3:45
RELEASED BY				
RECEIVED BY				
RELEASED BY				
RECEIVED BY				

	SIGNATURE	COMPANY	DATE	TIME	Method of Shipment
RELEASED BY					Shipping Ref:
RECEIVED BY					

To Be Filled Out By Analysing Laboratory
Security Seal: Chilled: LAB BATCH NUMBER
Sealed Containers: Frozen: Bill to:
Cool Box: Ambient: Address:

THIS FORM IS TO BE SIGNED BY GOLDER STAFF; COURIER/S; LABORATORY ON RECEIPT OF SAMPLES.

RL3
SNT004
Feb 2011

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES1928334**

Client	: **GOLDER ASSOCIATES**	Laboratory	: Environmental Division Sydney
Contact	: MR THEODORE ADCOCK	Contact	: Customer Services ES
Address	: LEVEL 1, 124 PACIFIC HIGHWAY ST LEONARDS NSW, AUSTRALIA 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: tadcock@golder.com.au	E-mail	: ALSEnviro.Sydney@ALSGlobal.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 19126714	Page	: 1 of 3
Order number	: PO22402	Quote number	: EM2017GOLASS0027 (EN/002/18 National BQ)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Waverton Bowling Club		
Sampler	: THEODORE ADCOCK		

Dates

Date Samples Received	: 04-Sep-2019 15:45	Issue Date	: 05-Sep-2019
Client Requested Due Date	: 11-Sep-2019	Scheduled Reporting Date	: **11-Sep-2019**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 5.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 20 / 17

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Sample QCB100 has been forwarded to Envirolab as per COC request.**
- **Extra sample BH01 0.9 received by ALS, this has been kept on hold.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Issue Date	:	05-Sep-2019
Page	:	2 of 3
Work Order	:	ES1928334 Amendment 0
Client	:	GOLDER ASSOCIATES

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EA200N Asbestos in Soils - (<1kg samples ONLY)	SOIL - EK025SF (Solids) Free CN by Segmented Flow Analyser	SOIL - EK055 (solids) Ammonia as N	SOIL - EP075 (solids) Semivolatile Organic Compounds	SOIL - S-19 TRH/BTEXN/PAH/Ph/OC/OP/PCB/8 metals
ES1928334-001	02-Sep-2019 00:00	BH01_0.1		✓	✓	✓	✓		✓
ES1928334-002	02-Sep-2019 00:00	BH01_0.5	✓						
ES1928334-003	02-Sep-2019 00:00	BH02_0.1		✓				✓	
ES1928334-004	02-Sep-2019 00:00	BH02_0.5		✓		✓	✓		✓
ES1928334-005	02-Sep-2019 00:00	BH03_0.1		✓	✓			✓	
ES1928334-006	02-Sep-2019 00:00	BH03_0.5		✓		✓	✓		
ES1928334-007	02-Sep-2019 00:00	BH04_0.1		✓				✓	
ES1928334-008	02-Sep-2019 00:00	BH04_0.5		✓					✓
ES1928334-009	02-Sep-2019 00:00	BH04_0.8		✓		✓	✓	✓	
ES1928334-010	02-Sep-2019 00:00	BH05_0.1		✓	✓				✓
ES1928334-011	02-Sep-2019 00:00	BH05_0.5	✓						
ES1928334-012	02-Sep-2019 00:00	BH05_0.9		✓		✓	✓	✓	
ES1928334-013	02-Sep-2019 00:00	Trans01		✓	✓				✓
ES1928334-016	02-Sep-2019 00:00	QCA100		✓		✓	✓		✓
ES1928334-021	02-Sep-2019 00:00	BH01 0.9	✓						

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - S-18 TRH(C6-C9)/BTEXN
ES1928334-018	[28-Aug-2019]	TS	✓
ES1928334-019	[30-Aug-2019]	TB	✓
ES1928334-020	[28-Aug-2019]	Trip Spike Control	✓

Issue Date	:	05-Sep-2019
Page	:	3 of 3
Work Order	:	ES1928334 Amendment 0
Client	:	GOLDER ASSOCIATES

Matrix: **SOLID**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOLID - EA200B Asbestos Identification in Bulk Solids (Excluding
ES1928334-014	02-Sep-2019 00:00	ASB01	✓

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - W-26T TRH/BTEXN/PAH/Total 8 Metals
ES1928334-017	02-Sep-2019 00:00	RB	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	au_accountspayable@golder.com.au

S DOYLE

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

THEODORE ADCOCK

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

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1928334**	Page	: 1 of 32
Client	: **GOLDER ASSOCIATES**	Laboratory	: Environmental Division Sydney
Contact	: MR THEODORE ADCOCK	Contact	: Customer Services ES
Address	: LEVEL 1, 124 PACIFIC HIGHWAY ST LEONARDS NSW, AUSTRALIA 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 19126714	Date Samples Received	: 04-Sep-2019 15:45
Order number	: PO22402	Date Analysis Commenced	: 06-Sep-2019
C-O-C number	: ----	Issue Date	: 11-Sep-2019 15:58
Sampler	: THEODORE ADCOCK		
Site	: Waverton Bowling Club		
Quote number	: EN/002/18 National BQ		
No. of samples received	: 20		
No. of samples analysed	: 17		

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*
Alana Smylie	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Evie Sidarta	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Ivan Taylor	Analyst	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.

- EP075: Poor surrogate recovery has been detected due to sample matrix
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) 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.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) 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: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EG005: Poor precision was obtained for Zinc on sample ES1928515-2. Results have been confirmed by re-extraction and re-analysis.
- **EA200 Legend**
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- 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.
- The trip spike and its control have been analysed for volatile TPH and BTEX only. EP080: The trip spike and control were prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab and the control retained.
- EP075: 'Sum of PAH' is the sum of the USEPA 16 priority PAHs
- EA200N: Asbestos weights and percentages are not covered under the Scope of NATA Accreditation.
  Weights of Asbestos are based on extracted bulk asbestos, fibre bundles, and/or ACM and do not include respirable fibres (if present)
  The Asbestos (Fines and Fibrous) weight is calculated from the extracted Fibrous Asbestos and Asbestos Fines as an equivalent weight of 100% Asbestos
  Percentages for Asbestos content in ACM are based on the 2013 NEPM default values.
  All calculations of percentage Asbestos under this method are approximate and should be used as a guide only.
- 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
- EA200N: ALS laboratory procedures and methods used for the identification and quantitation of asbestos are consistent with AS4964-2004 and the requirements of the 2013 NEPM for Assessment of Site Contamination

- 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.
- EA200: N/A - Not Applicable

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Work Order : ES1928334
Client : GOLDER ASSOCIATES
Project : 19126714

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH01_0.1	BH02_0.1	BH02_0.5	BH03_0.1	BH03_0.5
			Client sampling date / time	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00
Compound	CAS Number	LOR	Unit	ES1928334-001	ES1928334-003	ES1928334-004	ES1928334-005	ES1928334-006
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	----	14.8	----	15.6	14.3
Moisture Content	----	1.0	%	11.6	----	13.2	----	----
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	488	----	----	539	----
Synthetic Mineral Fibre	----	0.1	g/kg	No	----	----	No	----
Organic Fibre	----	0.1	g/kg	No	----	----	No	----
APPROVED IDENTIFIER:	----	-	--	A. SMYLIE	----	----	A. SMYLIE	----
EA200N: Asbestos Quantification (non-NATA)								
ø Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	<0.0004	----	----	<0.0004	----
ø Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	<0.001	----	----	<0.001	----
ø Asbestos Containing Material	1332-21-4	0.1	g	<0.1	----	----	<0.1	----
ø Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	% (w/w)	<0.01	----	----	<0.01	----
ø Weight Used for % Calculation	----	0.0001	kg	0.488	----	----	0.539	----
ø Fibrous Asbestos >7mm	----	0.0004	g	<0.0004	----	----	<0.0004	----
EG005(ED093)T: 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	7	----	3	----	----
Copper	7440-50-8	5	mg/kg	6	----	11	----	----
Lead	7439-92-1	5	mg/kg	8	----	6	----	----
Nickel	7440-02-0	2	mg/kg	4	----	10	----	----
Zinc	7440-66-6	5	mg/kg	17	----	22	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	1.4	----	0.9	----	----
EK025SF: Free CN by Segmented Flow Analyser								
Free Cyanide	----	1	mg/kg	<1	----	<1	----	<1
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	<20	----	<20	----	<20
EP066: Polychlorinated Biphenyls (PCB)								

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Work Order : ES1928334
Client : GOLDER ASSOCIATES
Project : 19126714

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH01_0.1	BH02_0.1	BH02_0.5	BH03_0.1	BH03_0.5
				Client sampling date / time	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00
Compound	CAS Number	LOR	Unit		ES1928334-001	ES1928334-003	ES1928334-004	ES1928334-005	ES1928334-006
					Result	Result	Result	Result	Result
EP066: Polychlorinated Biphenyls (PCB) - Continued									
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	72-54-8/72-55-9/50-29-3	0.05	mg/kg		<0.05	----	<0.05	----	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	----	<0.05	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	----	<0.05	----	----
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	----	<0.2	----	----
Dimethoate	60-51-5	0.05	mg/kg		<0.05	----	<0.05	----	----
Diazinon	333-41-5	0.05	mg/kg		<0.05	----	<0.05	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	----	<0.05	----	----

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Work Order : ES1928334
Client : GOLDER ASSOCIATES
Project : 19126714

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH01_0.1	BH02_0.1	BH02_0.5	BH03_0.1	BH03_0.5
				Client sampling date / time	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00
Compound	CAS Number	LOR	Unit		ES1928334-001	ES1928334-003	ES1928334-004	ES1928334-005	ES1928334-006
					Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued									
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	----	<0.2	----	----
Malathion	121-75-5	0.05	mg/kg		<0.05	----	<0.05	----	----
Fenthion	55-38-9	0.05	mg/kg		<0.05	----	<0.05	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	----	<0.05	----	----
Parathion	56-38-2	0.2	mg/kg		<0.2	----	<0.2	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	----	<0.05	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	----	<0.05	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	----	<0.05	----	----
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	----	<0.05	----	----
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	----	<0.05	----	----
Ethion	563-12-2	0.05	mg/kg		<0.05	----	<0.05	----	----
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	----	<0.05	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	----	<0.05	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	----	<0.5	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	----	<0.5	----	----
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	----	<0.5	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg		<1	----	<1	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	----	<0.5	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	----	<0.5	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	----	<0.5	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	----	<0.5	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		<0.5	----	<0.5	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	----	<0.5	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	----	<0.5	----	----
Pentachlorophenol	87-86-5	2	mg/kg		<2	----	<2	----	----
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	----	----

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Work Order : ES1928334
Client : GOLDER ASSOCIATES
Project : 19126714

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH01_0.1	BH02_0.1	BH02_0.5	BH03_0.1	BH03_0.5
				Client sampling date / time	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00
Compound	CAS Number	LOR	Unit		ES1928334-001	ES1928334-003	ES1928334-004	ES1928334-005	ES1928334-006
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
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		<0.5	----	<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**	----	----
EP075A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		----	<0.5	----	<0.5	----
2-Chlorophenol	95-57-8	0.5	mg/kg		----	<0.5	----	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg		----	<0.5	----	<0.5	----
3- & 4-Methylphenol	1319-77-3	0.5	mg/kg		----	<0.5	----	<0.5	----
2-Nitrophenol	88-75-5	0.5	mg/kg		----	<0.5	----	<0.5	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		----	<0.5	----	<0.5	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		----	<0.5	----	<0.5	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		----	<0.5	----	<0.5	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		----	<0.5	----	<0.5	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		----	<0.5	----	<0.5	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		----	<0.5	----	<0.5	----
Pentachlorophenol	87-86-5	1	mg/kg		----	<1	----	<1	----
EP075B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		----	<0.5	----	<0.5	----
2-Methylnaphthalene	91-57-6	0.5	mg/kg		----	<0.5	----	<0.5	----
2-Chloronaphthalene	91-58-7	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	----

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Work Order : ES1928334
Client : GOLDER ASSOCIATES
Project : 19126714

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH01_0.1	BH02_0.1	BH02_0.5	BH03_0.1	BH03_0.5
				Client sampling date / time	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00
Compound	CAS Number	LOR	Unit		ES1928334-001	ES1928334-003	ES1928334-004	ES1928334-005	ES1928334-006
					Result	Result	Result	Result	Result
EP075B: Polynuclear Aromatic Hydrocarbons - Continued									
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	----
N-2-Fluorenyl Acetamide	53-96-3	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) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg		----	<1	----	<1	----
7.12-Dimethylbenz(a)anthracene	57-97-6	0.5	mg/kg		----	<0.5	----	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	<0.5	----	<0.5	----
3-Methylcholanthrene	56-49-5	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 PAHs	----	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**	----
EP075C: Phthalate Esters									
Dimethyl phthalate	131-11-3	0.5	mg/kg		----	<0.5	----	<0.5	----
Diethyl phthalate	84-66-2	0.5	mg/kg		----	<0.5	----	<0.5	----
Di-n-butyl phthalate	84-74-2	0.5	mg/kg		----	<0.5	----	<0.5	----
Butyl benzyl phthalate	85-68-7	0.5	mg/kg		----	<0.5	----	<0.5	----
bis(2-ethylhexyl) phthalate	117-81-7	5.0	mg/kg		----	<5.0	----	<5.0	----
Di-n-octylphthalate	117-84-0	0.5	mg/kg		----	<0.5	----	<0.5	----
EP075D: Nitrosamines									
N-Nitrosomethylethylamine	10595-95-6	0.5	mg/kg		----	<0.5	----	<0.5	----
N-Nitrosodiethylamine	55-18-5	0.5	mg/kg		----	<0.5	----	<0.5	----
N-Nitrosopyrrolidine	930-55-2	1.0	mg/kg		----	<1.0	----	<1.0	----
N-Nitrosomorpholine	59-89-2	0.5	mg/kg		----	<0.5	----	<0.5	----
N-Nitrosodi-n-propylamine	621-64-7	0.5	mg/kg		----	<0.5	----	<0.5	----
N-Nitrosopiperidine	100-75-4	0.5	mg/kg		----	<0.5	----	<0.5	----
N-Nitrosodibutylamine	924-16-3	0.5	mg/kg		----	<0.5	----	<0.5	----
N-Nitrosodiphenyl & Diphenylamine	86-30-6 122-39-4	1.0	mg/kg		----	<1.0	----	<1.0	----

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH01_0.1	BH02_0.1	BH02_0.5	BH03_0.1	BH03_0.5
				Client sampling date / time	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00
Compound	CAS Number	LOR	Unit		ES1928334-001	ES1928334-003	ES1928334-004	ES1928334-005	ES1928334-006
					Result	Result	Result	Result	Result
EP075D: Nitrosamines - Continued									
Methapyrilene	91-80-5	0.5	mg/kg		----	<0.5	----	<0.5	----
EP075E: Nitroaromatics and Ketones									
2-Picoline	109-06-8	0.5	mg/kg		----	<0.5	----	<0.5	----
Acetophenone	98-86-2	0.5	mg/kg		----	<0.5	----	<0.5	----
Nitrobenzene	98-95-3	0.5	mg/kg		----	<0.5	----	<0.5	----
Isophorone	78-59-1	0.5	mg/kg		----	<0.5	----	<0.5	----
2.6-Dinitrotoluene	606-20-2	1.0	mg/kg		----	<1.0	----	<1.0	----
2.4-Dinitrotoluene	121-14-2	1.0	mg/kg		----	<1.0	----	<1.0	----
1-Naphthylamine	134-32-7	0.5	mg/kg		----	<0.5	----	<0.5	----
4-Nitroquinoline-N-oxide	56-57-5	0.5	mg/kg		----	<0.5	----	<0.5	----
5-Nitro-o-toluidine	99-55-8	0.5	mg/kg		----	<0.5	----	<0.5	----
Azobenzene	103-33-3	1	mg/kg		----	<1	----	<1	----
1.3.5-Trinitrobenzene	99-35-4	0.5	mg/kg		----	<0.5	----	<0.5	----
Phenacetin	62-44-2	0.5	mg/kg		----	<0.5	----	<0.5	----
4-Aminobiphenyl	92-67-1	0.5	mg/kg		----	<0.5	----	<0.5	----
Pentachloronitrobenzene	82-68-8	0.5	mg/kg		----	<0.5	----	<0.5	----
Pronamide	23950-58-5	0.5	mg/kg		----	<0.5	----	<0.5	----
Dimethylaminoazobenzene	60-11-7	0.5	mg/kg		----	<0.5	----	<0.5	----
Chlorobenzilate	510-15-6	0.5	mg/kg		----	<0.5	----	<0.5	----
EP075F: Haloethers									
Bis(2-chloroethyl) ether	111-44-4	0.5	mg/kg		----	<0.5	----	<0.5	----
Bis(2-chloroethoxy) methane	111-91-1	0.5	mg/kg		----	<0.5	----	<0.5	----
4-Chlorophenyl phenyl ether	7005-72-3	0.5	mg/kg		----	<0.5	----	<0.5	----
4-Bromophenyl phenyl ether	101-55-3	0.5	mg/kg		----	<0.5	----	<0.5	----
EP075G: Chlorinated Hydrocarbons									
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg		----	<0.5	----	<0.5	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg		----	<0.5	----	<0.5	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg		----	<0.5	----	<0.5	----
Hexachloroethane	67-72-1	0.5	mg/kg		----	<0.5	----	<0.5	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg		----	<0.5	----	<0.5	----
Hexachloropropylene	1888-71-7	0.5	mg/kg		----	<0.5	----	<0.5	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg		----	<0.5	----	<0.5	----
Hexachlorocyclopentadiene	77-47-4	2.5	mg/kg		----	<2.5	----	<2.5	----
Pentachlorobenzene	608-93-5	0.5	mg/kg		----	<0.5	----	<0.5	----

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH01_0.1	BH02_0.1	BH02_0.5	BH03_0.1	BH03_0.5
				Client sampling date / time	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00
Compound	CAS Number	LOR	Unit		ES1928334-001	ES1928334-003	ES1928334-004	ES1928334-005	ES1928334-006
					Result	Result	Result	Result	Result
EP075G: Chlorinated Hydrocarbons - Continued									
Hexachlorobenzene (HCB)	118-74-1	1.0	mg/kg	----	<1.0	----	<1.0	----	
EP075H: Anilines and Benzidines									
Aniline	62-53-3	0.5	mg/kg	----	<0.5	----	<0.5	----	
4-Chloroaniline	106-47-8	0.5	mg/kg	----	<0.5	----	<0.5	----	
2-Nitroaniline	88-74-4	1.0	mg/kg	----	<1.0	----	<1.0	----	
3-Nitroaniline	99-09-2	1.0	mg/kg	----	<1.0	----	<1.0	----	
Dibenzofuran	132-64-9	0.5	mg/kg	----	<0.5	----	<0.5	----	
4-Nitroaniline	100-01-6	0.5	mg/kg	----	<0.5	----	<0.5	----	
Carbazole	86-74-8	0.5	mg/kg	----	<0.5	----	<0.5	----	
3.3`-Dichlorobenzidine	91-94-1	0.5	mg/kg	----	<0.5	----	<0.5	----	
EP075I: Organochlorine Pesticides									
alpha-BHC	319-84-6	0.5	mg/kg	----	<0.5	----	<0.5	----	
beta-BHC	319-85-7	0.5	mg/kg	----	<0.5	----	<0.5	----	
gamma-BHC	58-89-9	0.5	mg/kg	----	<0.5	----	<0.5	----	
delta-BHC	319-86-8	0.5	mg/kg	----	<0.5	----	<0.5	----	
Heptachlor	76-44-8	0.5	mg/kg	----	<0.5	----	<0.5	----	
Aldrin	309-00-2	0.5	mg/kg	----	<0.5	----	<0.5	----	
Heptachlor epoxide	1024-57-3	0.5	mg/kg	----	<0.5	----	<0.5	----	
alpha-Endosulfan	959-98-8	0.5	mg/kg	----	<0.5	----	<0.5	----	
4.4`-DDE	72-55-9	0.5	mg/kg	----	<0.5	----	<0.5	----	
Dieldrin	60-57-1	0.5	mg/kg	----	<0.5	----	<0.5	----	
Endrin	72-20-8	0.5	mg/kg	----	<0.5	----	<0.5	----	
beta-Endosulfan	33213-65-9	0.5	mg/kg	----	<0.5	----	<0.5	----	
4.4`-DDD	72-54-8	0.5	mg/kg	----	<0.5	----	<0.5	----	
Endosulfan sulfate	1031-07-8	0.5	mg/kg	----	<0.5	----	<0.5	----	
4.4`-DDT	50-29-3	1.0	mg/kg	----	<1.0	----	<1.0	----	
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	mg/kg	----	<0.5	----	<0.5	----	
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.5	mg/kg	----	<0.5	----	<0.5	----	
EP075J: Organophosphorus Pesticides									
Dichlorvos	62-73-7	0.5	mg/kg	----	<0.5	----	<0.5	----	
Dimethoate	60-51-5	0.5	mg/kg	----	<0.5	----	<0.5	----	
Diazinon	333-41-5	0.5	mg/kg	----	<0.5	----	<0.5	----	
Chlorpyrifos-methyl	5598-13-0	0.5	mg/kg	----	<0.5	----	<0.5	----	

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH01_0.1	BH02_0.1	BH02_0.5	BH03_0.1	BH03_0.5
			Client sampling date / time	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00
Compound	CAS Number	LOR	Unit	ES1928334-001	ES1928334-003	ES1928334-004	ES1928334-005	ES1928334-006
				Result	Result	Result	Result	Result
EP075J: Organophosphorus Pesticides - Continued								
Malathion	121-75-5	0.5	mg/kg	----	<0.5	----	<0.5	----
Fenthion	55-38-9	0.5	mg/kg	----	<0.5	----	<0.5	----
Chlorpyrifos	2921-88-2	0.5	mg/kg	----	<0.5	----	<0.5	----
Pirimphos-ethyl	23505-41-1	0.5	mg/kg	----	<0.5	----	<0.5	----
Chlorfenvinphos	470-90-6	0.5	mg/kg	----	<0.5	----	<0.5	----
Prothiofos	34643-46-4	0.5	mg/kg	----	<0.5	----	<0.5	----
Ethion	563-12-2	0.5	mg/kg	----	<0.5	----	<0.5	----
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	**190**	----	<100	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	**190**	----	<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	**220**	----	<100	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	**220**	----	<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	----	----
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	**108**	----	**111**	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH01_0.1	BH02_0.1	BH02_0.5	BH03_0.1	BH03_0.5
				Client sampling date / time	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00
Compound	CAS Number	LOR	Unit		ES1928334-001	ES1928334-003	ES1928334-004	ES1928334-005	ES1928334-006
					Result	Result	Result	Result	Result
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		77.9	----	80.6	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		119	----	87.4	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		107	----	99.9	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		104	----	97.4	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		84.5	----	70.2	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		97.4	----	88.7	----	----
Anthracene-d10	1719-06-8	0.5	%		114	----	113	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		121	----	113	----	----
EP075S: Acid Extractable Surrogates									
2-Fluorophenol	367-12-4	0.5	%		----	87.0	----	79.7	----
Phenol-d6	13127-88-3	0.5	%		----	70.4	----	66.6	----
2-Chlorophenol-D4	93951-73-6	0.5	%		----	78.2	----	61.0	----
2.4.6-Tribromophenol	118-79-6	0.5	%		----	78.8	----	70.0	----
EP075T: Base/Neutral Extractable Surrogates									
Nitrobenzene-D5	4165-60-0	0.5	%		----	106	----	80.5	----
1.2-Dichlorobenzene-D4	2199-69-1	0.5	%		----	94.1	----	88.8	----
2-Fluorobiphenyl	321-60-8	0.5	%		----	108	----	105	----
Anthracene-d10	1719-06-8	0.5	%		----	105	----	104	----
4-Terphenyl-d14	1718-51-0	0.5	%		----	108	----	117	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		103	----	91.8	----	----
Toluene-D8	2037-26-5	0.2	%		110	----	101	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		111	----	97.5	----	----

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH04_0.1	BH04_0.5	BH04_0.8	BH05_0.1	BH05_0.9
			Client sampling date / time	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00
Compound	CAS Number	LOR	Unit	ES1928334-007	ES1928334-008	ES1928334-009	ES1928334-010	ES1928334-012
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	12.4	----	28.3	----	41.4
Moisture Content	----	1.0	%	----	21.4	----	14.3	----
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	----	----	----	529	----
Synthetic Mineral Fibre	----	0.1	g/kg	----	----	----	No	----
Organic Fibre	----	0.1	g/kg	----	----	----	No	----
APPROVED IDENTIFIER:	----	-	--	----	----	----	A. SMYLIE	----
EA200N: Asbestos Quantification (non-NATA)								
ø Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	----	----	----	<0.0004	----
ø Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	----	----	----	<0.001	----
ø Asbestos Containing Material	1332-21-4	0.1	g	----	----	----	<0.1	----
ø Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	% (w/w)	----	----	----	<0.01	----
ø Weight Used for % Calculation	----	0.0001	kg	----	----	----	0.529	----
ø Fibrous Asbestos >7mm	----	0.0004	g	----	----	----	<0.0004	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	<5	----	13	----
Cadmium	7440-43-9	1	mg/kg	----	<1	----	<1	----
Chromium	7440-47-3	2	mg/kg	----	11	----	7	----
Copper	7440-50-8	5	mg/kg	----	15	----	20	----
Lead	7439-92-1	5	mg/kg	----	<5	----	27	----
Nickel	7440-02-0	2	mg/kg	----	25	----	4	----
Zinc	7440-66-6	5	mg/kg	----	9	----	26	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	0.3	----	1.5	----
EK025SF: Free CN by Segmented Flow Analyser								
Free Cyanide	----	1	mg/kg	----	----	<1	----	<1
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	----	----	<20	----	<20
EP066: Polychlorinated Biphenyls (PCB)								

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH04_0.1	BH04_0.5	BH04_0.8	BH05_0.1	BH05_0.9
				Client sampling date / time	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00
Compound	CAS Number	LOR	Unit		ES1928334-007	ES1928334-008	ES1928334-009	ES1928334-010	ES1928334-012
					Result	Result	Result	Result	Result
EP066: Polychlorinated Biphenyls (PCB) - Continued									
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	----	**0.22**	----
trans-Chlordane	5103-74-2	0.05	mg/kg		----	<0.05	----	**0.11**	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	<0.05	----	<0.05	----
cis-Chlordane	5103-71-9	0.05	mg/kg		----	<0.05	----	**0.11**	----
Dieldrin	60-57-1	0.05	mg/kg		----	<0.05	----	**0.05**	----
4.4`-DDE	72-55-9	0.05	mg/kg		----	<0.05	----	**0.11**	----
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	72-54-8/72-55-9/50-29-3	0.05	mg/kg		----	<0.05	----	**0.11**	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		----	<0.05	----	<0.05	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		----	<0.05	----	<0.05	----
Monocrotophos	6923-22-4	0.2	mg/kg		----	<0.2	----	<0.2	----
Dimethoate	60-51-5	0.05	mg/kg		----	<0.05	----	<0.05	----
Diazinon	333-41-5	0.05	mg/kg		----	<0.05	----	<0.05	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		----	<0.05	----	<0.05	----

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Work Order : ES1928334
Client : GOLDER ASSOCIATES
Project : 19126714

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH04_0.1	BH04_0.5	BH04_0.8	BH05_0.1	BH05_0.9
				Client sampling date / time	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00
Compound	CAS Number	LOR	Unit		ES1928334-007	ES1928334-008	ES1928334-009	ES1928334-010	ES1928334-012
					Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued									
Parathion-methyl	298-00-0	0.2	mg/kg		----	<0.2	----	<0.2	----
Malathion	121-75-5	0.05	mg/kg		----	<0.05	----	<0.05	----
Fenthion	55-38-9	0.05	mg/kg		----	<0.05	----	<0.05	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		----	<0.05	----	<0.05	----
Parathion	56-38-2	0.2	mg/kg		----	<0.2	----	<0.2	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		----	<0.05	----	<0.05	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		----	<0.05	----	<0.05	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		----	<0.05	----	<0.05	----
Fenamiphos	22224-92-6	0.05	mg/kg		----	<0.05	----	<0.05	----
Prothiofos	34643-46-4	0.05	mg/kg		----	<0.05	----	<0.05	----
Ethion	563-12-2	0.05	mg/kg		----	<0.05	----	<0.05	----
Carbophenothion	786-19-6	0.05	mg/kg		----	<0.05	----	<0.05	----
Azinphos Methyl	86-50-0	0.05	mg/kg		----	<0.05	----	<0.05	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		----	<0.5	----	<0.5	----
2-Chlorophenol	95-57-8	0.5	mg/kg		----	<0.5	----	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg		----	<0.5	----	<0.5	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg		----	<1	----	<1	----
2-Nitrophenol	88-75-5	0.5	mg/kg		----	<0.5	----	<0.5	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		----	<0.5	----	<0.5	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		----	<0.5	----	<0.5	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		----	<0.5	----	<0.5	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		----	<0.5	----	<0.5	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		----	<0.5	----	<0.5	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		----	<0.5	----	<0.5	----
Pentachlorophenol	87-86-5	2	mg/kg		----	<2	----	<2	----
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	----	**1.0**	----
Anthracene	120-12-7	0.5	mg/kg		----	<0.5	----	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg		----	<0.5	----	**1.3**	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH04_0.1	BH04_0.5	BH04_0.8	BH05_0.1	BH05_0.9
				Client sampling date / time	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00
Compound	CAS Number	LOR	Unit		ES1928334-007	ES1928334-008	ES1928334-009	ES1928334-010	ES1928334-012
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Pyrene	129-00-0	0.5	mg/kg		----	<0.5	----	**1.3**	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	<0.5	----	<0.5	----
Chrysene	218-01-9	0.5	mg/kg		----	<0.5	----	<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		----	<0.5	----	**4.1**	----
^ 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**	----
EP075A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
3- & 4-Methylphenol	1319-77-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Pentachlorophenol	87-86-5	1	mg/kg		<1	----	<1	----	<1
EP075B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
2-Methylnaphthalene	91-57-6	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
2-Chloronaphthalene	91-58-7	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

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Work Order : ES1928334
Client : GOLDER ASSOCIATES
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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH04_0.1	BH04_0.5	BH04_0.8	BH05_0.1	BH05_0.9
				Client sampling date / time	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00
Compound	CAS Number	LOR	Unit		ES1928334-007	ES1928334-008	ES1928334-009	ES1928334-010	ES1928334-012
					Result	Result	Result	Result	Result
EP075B: Polynuclear Aromatic Hydrocarbons - Continued									
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
N-2-Fluorenyl Acetamide	53-96-3	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) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg		<1	----	<1	----	<1
7.12-Dimethylbenz(a)anthracene	57-97-6	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
3-Methylcholanthrene	56-49-5	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
^ Sum of PAHs	----	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**
EP075C: Phthalate Esters									
Dimethyl phthalate	131-11-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Diethyl phthalate	84-66-2	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Di-n-butyl phthalate	84-74-2	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Butyl benzyl phthalate	85-68-7	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
bis(2-ethylhexyl) phthalate	117-81-7	5.0	mg/kg		<5.0	----	<5.0	----	<5.0
Di-n-octylphthalate	117-84-0	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
EP075D: Nitrosamines									
N-Nitrosomethylethylamine	10595-95-6	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
N-Nitrosodiethylamine	55-18-5	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
N-Nitrosopyrrolidine	930-55-2	1.0	mg/kg		<1.0	----	<1.0	----	<1.0
N-Nitrosomorpholine	59-89-2	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
N-Nitrosodi-n-propylamine	621-64-7	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
N-Nitrosopiperidine	100-75-4	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
N-Nitrosodibutylamine	924-16-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
N-Nitrosodiphenyl & Diphenylamine	86-30-6 122-39-4	1.0	mg/kg		<1.0	----	<1.0	----	<1.0

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Work Order : ES1928334
Client : GOLDER ASSOCIATES
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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH04_0.1	BH04_0.5	BH04_0.8	BH05_0.1	BH05_0.9
				Client sampling date / time	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00
Compound	CAS Number	LOR	Unit		ES1928334-007	ES1928334-008	ES1928334-009	ES1928334-010	ES1928334-012
					Result	Result	Result	Result	Result
EP075D: Nitrosamines - Continued									
Methapyrilene	91-80-5	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
EP075E: Nitroaromatics and Ketones									
2-Picoline	109-06-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Acetophenone	98-86-2	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Nitrobenzene	98-95-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Isophorone	78-59-1	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
2.6-Dinitrotoluene	606-20-2	1.0	mg/kg		<1.0	----	<1.0	----	<1.0
2.4-Dinitrotoluene	121-14-2	1.0	mg/kg		<1.0	----	<1.0	----	<1.0
1-Naphthylamine	134-32-7	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
4-Nitroquinoline-N-oxide	56-57-5	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
5-Nitro-o-toluidine	99-55-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Azobenzene	103-33-3	1	mg/kg		<1	----	<1	----	<1
1.3.5-Trinitrobenzene	99-35-4	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Phenacetin	62-44-2	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
4-Aminobiphenyl	92-67-1	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Pentachloronitrobenzene	82-68-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Pronamide	23950-58-5	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Dimethylaminoazobenzene	60-11-7	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Chlorobenzilate	510-15-6	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
EP075F: Haloethers									
Bis(2-chloroethyl) ether	111-44-4	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Bis(2-chloroethoxy) methane	111-91-1	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
4-Chlorophenyl phenyl ether	7005-72-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
4-Bromophenyl phenyl ether	101-55-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
EP075G: Chlorinated Hydrocarbons									
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Hexachloroethane	67-72-1	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Hexachloropropylene	1888-71-7	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Hexachlorocyclopentadiene	77-47-4	2.5	mg/kg		<2.5	----	<2.5	----	<2.5
Pentachlorobenzene	608-93-5	0.5	mg/kg		<0.5	----	<0.5	----	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH04_0.1	BH04_0.5	BH04_0.8	BH05_0.1	BH05_0.9
				Client sampling date / time	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00
Compound	CAS Number	LOR	Unit		ES1928334-007	ES1928334-008	ES1928334-009	ES1928334-010	ES1928334-012
					Result	Result	Result	Result	Result
EP075G: Chlorinated Hydrocarbons - Continued									
Hexachlorobenzene (HCB)	118-74-1	1.0	mg/kg		<1.0	----	<1.0	----	<1.0
EP075H: Anilines and Benzidines									
Aniline	62-53-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
4-Chloroaniline	106-47-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
2-Nitroaniline	88-74-4	1.0	mg/kg		<1.0	----	<1.0	----	<1.0
3-Nitroaniline	99-09-2	1.0	mg/kg		<1.0	----	<1.0	----	<1.0
Dibenzofuran	132-64-9	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
4-Nitroaniline	100-01-6	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Carbazole	86-74-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
3.3`-Dichlorobenzidine	91-94-1	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
EP075I: Organochlorine Pesticides									
alpha-BHC	319-84-6	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
beta-BHC	319-85-7	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
gamma-BHC	58-89-9	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
delta-BHC	319-86-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Heptachlor	76-44-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Aldrin	309-00-2	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Heptachlor epoxide	1024-57-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
alpha-Endosulfan	959-98-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
4.4`-DDE	72-55-9	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Dieldrin	60-57-1	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Endrin	72-20-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
beta-Endosulfan	33213-65-9	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
4.4`-DDD	72-54-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Endosulfan sulfate	1031-07-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
4.4`-DDT	50-29-3	1.0	mg/kg		<1.0	----	<1.0	----	<1.0
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
EP075J: Organophosphorus Pesticides									
Dichlorvos	62-73-7	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Dimethoate	60-51-5	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Diazinon	333-41-5	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Chlorpyrifos-methyl	5598-13-0	0.5	mg/kg		<0.5	----	<0.5	----	<0.5

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Work Order : ES1928334
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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH04_0.1	BH04_0.5	BH04_0.8	BH05_0.1	BH05_0.9
				Client sampling date / time	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00
Compound	CAS Number	LOR	Unit		ES1928334-007	ES1928334-008	ES1928334-009	ES1928334-010	ES1928334-012
					Result	Result	Result	Result	Result
EP075J: Organophosphorus Pesticides - Continued									
Malathion	121-75-5	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Fenthion	55-38-9	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Chlorpyrifos	2921-88-2	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Pirimphos-ethyl	23505-41-1	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Chlorfenvinphos	470-90-6	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Prothiofos	34643-46-4	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Ethion	563-12-2	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
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	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		----	124	----	122	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH04_0.1	BH04_0.5	BH04_0.8	BH05_0.1	BH05_0.9
				Client sampling date / time	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00	02-Sep-2019 00:00
Compound	CAS Number	LOR	Unit		ES1928334-007	ES1928334-008	ES1928334-009	ES1928334-010	ES1928334-012
					Result	Result	Result	Result	Result
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	80.2	----	118	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	68.2	----	83.4	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	88.1	----	99.3	----
2-Chlorophenol-D4	93951-73-6	0.5	%		----	77.9	----	97.8	----
2.4.6-Tribromophenol	118-79-6	0.5	%		----	40.8	----	75.1	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	111	----	92.0	----
Anthracene-d10	1719-06-8	0.5	%		----	77.4	----	111	----
4-Terphenyl-d14	1718-51-0	0.5	%		----	96.6	----	119	----
EP075S: Acid Extractable Surrogates									
2-Fluorophenol	367-12-4	0.5	%		70.7	----	38.5	----	8.07
Phenol-d6	13127-88-3	0.5	%		67.6	----	39.1	----	10.8
2-Chlorophenol-D4	93951-73-6	0.5	%		66.3	----	39.2	----	20.0
2.4.6-Tribromophenol	118-79-6	0.5	%		52.8	----	30.2	----	9.52
EP075T: Base/Neutral Extractable Surrogates									
Nitrobenzene-D5	4165-60-0	0.5	%		92.0	----	96.8	----	66.6
1.2-Dichlorobenzene-D4	2199-69-1	0.5	%		83.2	----	88.0	----	81.8
2-Fluorobiphenyl	321-60-8	0.5	%		88.3	----	92.7	----	92.9
Anthracene-d10	1719-06-8	0.5	%		96.2	----	73.6	----	71.6
4-Terphenyl-d14	1718-51-0	0.5	%		111	----	98.6	----	97.3
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		----	96.9	----	104	----
Toluene-D8	2037-26-5	0.2	%		----	101	----	107	----
4-Bromofluorobenzene	460-00-4	0.2	%		----	94.1	----	108	----

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	Trans01	QCA100	TS	TB	Trip Spike Control
			Client sampling date / time	02-Sep-2019 00:00	02-Sep-2019 00:00	[28-Aug-2019]	[30-Aug-2019]	[28-Aug-2019]
Compound	CAS Number	LOR	Unit	ES1928334-013	ES1928334-016	ES1928334-018	ES1928334-019	ES1928334-020
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	6.2	12.8	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	Yes	----	----	----	----
Asbestos (Trace)	1332-21-4	5	Fibres	No	----	----	----	----
Asbestos Type	1332-21-4	-	--	Ch + Am	----	----	----	----
Sample weight (dry)	----	0.01	g	749	----	----	----	----
Synthetic Mineral Fibre	----	0.1	g/kg	No	----	----	----	----
Organic Fibre	----	0.1	g/kg	No	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	A. SMYLIE	----	----	----	----
EA200N: Asbestos Quantification (non-NATA)								
ø Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	<0.0004	----	----	----	----
ø Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	<0.001	----	----	----	----
ø Asbestos Containing Material	1332-21-4	0.1	g	6.6	----	----	----	----
ø Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	% (w/w)	0.13	----	----	----	----
ø Weight Used for % Calculation	----	0.0001	kg	0.749	----	----	----	----
ø Fibrous Asbestos >7mm	----	0.0004	g	<0.0004	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	6	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	10	7	----	----	----
Copper	7440-50-8	5	mg/kg	20	7	----	----	----
Lead	7439-92-1	5	mg/kg	53	9	----	----	----
Nickel	7440-02-0	2	mg/kg	3	4	----	----	----
Zinc	7440-66-6	5	mg/kg	63	21	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	2.2	0.9	----	----	----
EK025SF: Free CN by Segmented Flow Analyser								
Free Cyanide	----	1	mg/kg	----	<1	----	----	----
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	----	<20	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	----	----	----

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Trans01	QCA100	TS	TB	Trip Spike Control
				Client sampling date / time	02-Sep-2019 00:00	02-Sep-2019 00:00	[28-Aug-2019]	[30-Aug-2019]	[28-Aug-2019]
Compound	CAS Number	LOR	Unit		ES1928334-013	ES1928334-016	ES1928334-018	ES1928334-019	ES1928334-020
					Result	Result	Result	Result	Result
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		**0.14**	<0.05	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		**0.08**	<0.05	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		**0.06**	<0.05	----	----	----
Dieldrin	60-57-1	0.05	mg/kg		**0.08**	<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		**0.08**	<0.05	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	<0.05	----	----	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	----	----	----
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	----	----	----
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	----	----	----
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	----	----	----

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Client : GOLDER ASSOCIATES
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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Trans01	QCA100	TS	TB	Trip Spike Control
				Client sampling date / time	02-Sep-2019 00:00	02-Sep-2019 00:00	[28-Aug-2019]	[30-Aug-2019]	[28-Aug-2019]
Compound	CAS Number	LOR	Unit		ES1928334-013	ES1928334-016	ES1928334-018	ES1928334-019	ES1928334-020
					Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued									
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	----	----	----
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	----	----	----
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	----	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	<0.5	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	<0.5	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	<0.5	----	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg		<1	<1	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	<0.5	----	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	<0.5	----	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	----	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		<0.5	<0.5	----	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	<0.5	----	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	<0.5	----	----	----
Pentachlorophenol	87-86-5	2	mg/kg		<2	<2	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		**2.2**	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg		**0.9**	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		**4.7**	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg		**4.7**	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		**2.2**	<0.5	----	----	----

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Trans01	QCA100	TS	TB	Trip Spike Control
				Client sampling date / time	02-Sep-2019 00:00	02-Sep-2019 00:00	[28-Aug-2019]	[30-Aug-2019]	[28-Aug-2019]
Compound	CAS Number	LOR	Unit		ES1928334-013	ES1928334-016	ES1928334-018	ES1928334-019	ES1928334-020
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Chrysene	218-01-9	0.5	mg/kg		2.1	<0.5	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		2.7	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		0.9	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		2.2	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		1.2	<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		1.6	<0.5	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		25.4	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		2.9	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		3.2	0.6	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		3.4	1.2	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	64	<10	70
C10 - C14 Fraction	----	50	mg/kg		<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg		100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg		100	240	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		200	240	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	78	<10	84
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	38	<10	41
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		170	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	280	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		170	280	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	0.2	<0.2	0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	17.4	<0.5	19.3
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	2.7	<0.5	2.8
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	14.4	<0.5	15.2
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	5.4	<0.5	5.7
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	40.1	<0.2	43.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	19.8	<0.5	20.9

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Trans01	QCA100	TS	TB	Trip Spike Control
				Client sampling date / time	02-Sep-2019 00:00	02-Sep-2019 00:00	[28-Aug-2019]	[30-Aug-2019]	[28-Aug-2019]
Compound	CAS Number	LOR	Unit		ES1928334-013	ES1928334-016	ES1928334-018	ES1928334-019	ES1928334-020
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		112	113	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		91.2	93.4	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		79.2	137	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		101	97.7	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		98.2	96.1	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		74.3	70.8	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		91.2	89.8	----	----	----
Anthracene-d10	1719-06-8	0.5	%		108	109	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		115	117	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		88.9	107	82.4	108	81.5
Toluene-D8	2037-26-5	0.2	%		79.3	108	94.3	106	93.2
4-Bromofluorobenzene	460-00-4	0.2	%		86.8	108	90.4	119	90.5

Analytical Results

Sub-Matrix: SOLID (Matrix: SOLID)				Client sample ID	ASB01	----	----	----	----
				Client sampling date / time	02-Sep-2019 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1928334-014	--------	--------	--------	--------
					Result	----	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples									
Asbestos Detected	1332-21-4	0.1	g/kg		**Yes**	----	----	----	----
Asbestos Type	1332-21-4	-	--		**Ch**	----	----	----	----
Sample weight (dry)	----	0.01	g		**38.0**	----	----	----	----
APPROVED IDENTIFIER:	----	-	--		**A. RISTOSKI**	----	----	----	----

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Work Order : ES1928334
Client : GOLDER ASSOCIATES
Project : 19126714

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	RB	----	----	----	----
				Client sampling date / time	02-Sep-2019 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1928334-017	--------	--------	--------	--------
					Result	----	----	----	----
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L		<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L		<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L		<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L		<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L		<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L		<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	RB	----	----	----	----
				Client sampling date / time	02-Sep-2019 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1928334-017	--------	--------	--------	--------
					Result	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		<100	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ **Total Xylenes**	----	2	µg/L		<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		**17.9**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%		**41.0**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1.0	%		**98.2**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		**96.4**	----	----	----	----
Anthracene-d10	1719-06-8	1.0	%		**71.5**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%		**88.4**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**113**	----	----	----	----
Toluene-D8	2037-26-5	2	%		**121**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**104**	----	----	----	----

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	BH01_0.1 - 02-Sep-2019 00:00	Mid brown soil.
EA200: Description	BH03_0.1 - 02-Sep-2019 00:00	Mid brown soil.
EA200: Description	BH05_0.1 - 02-Sep-2019 00:00	Mid brown soil.
EA200: Description	Trans01 - 02-Sep-2019 00:00	Mid brown soil containing one piece of asbestos cement sheeting approximately 40x40x5mm.

Sub-Matrix: **SOLID**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples		
EA200: Description	ASB01 - 02-Sep-2019 00:00	Several pieces of asbestos cement sheeting approximately 55x30x5mm.

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	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
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	29	149
Phenol-d6	13127-88-3	32	128
2-Chlorophenol-D4	93951-73-6	32	128
2.4.6-Tribromophenol	118-79-6	13	121
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	33	125
1.2-Dichlorobenzene-D4	2199-69-1	34	108
2-Fluorobiphenyl	321-60-8	35	121
Anthracene-d10	1719-06-8	35	123
4-Terphenyl-d14	1718-51-0	33	125
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)T: PAH Surrogates - Continued			
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES1928334**	Page	: 1 of 20
Client	: **GOLDER ASSOCIATES**	Laboratory	: Environmental Division Sydney
Contact	: MR THEODORE ADCOCK	Contact	: Customer Services ES
Address	: LEVEL 1, 124 PACIFIC HIGHWAY ST LEONARDS NSW, AUSTRALIA 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 19126714	Date Samples Received	: 04-Sep-2019
Order number	: PO22402	Date Analysis Commenced	: 06-Sep-2019
C-O-C number	: ----	Issue Date	: 11-Sep-2019
Sampler	: THEODORE ADCOCK		
Site	: Waverton Bowling Club		
Quote number	: EN/002/18 National BQ		
No. of samples received	: 20		
No. of samples analysed	: 17		

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*
Alana Smylie	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Evie Sidarta	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

Page	:	2 of 20
Work Order	:	ES1928334
Client	:	GOLDER ASSOCIATES
Project	:	19126714

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 (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 2568948)									
ES1928039-052	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	75	66	13.1	0% - 20%
		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	9	8	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.00	No Limit
ES1928515-002	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	291	312	6.71	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	70	74	6.40	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	6	18.2	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	54	84	44.5	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	44	35	22.7	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	305	# 388	24.0	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2568951)									
ES1928039-056	Anonymous	EA055: Moisture Content	----	0.1	%	3.7	4.1	12.1	No Limit
EW1903881-003	Anonymous	EA055: Moisture Content	----	0.1	%	14.5	14.4	0.00	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2571467)									
ES1928334-006	BH03_0.5	EA055: Moisture Content	----	0.1	%	14.3	15.0	4.23	0% - 20%
ES1928500-008	Anonymous	EA055: Moisture Content	----	0.1	%	8.8	8.0	8.81	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2568949)									
ES1928039-052	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1928515-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	0.2	0.00	No Limit
EK025SF: Free CN by Segmented Flow Analyser (QC Lot: 2575139)									

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Work Order : ES1928334
Client : GOLDER ASSOCIATES
Project : 19126714

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 (%)*
EK025SF: Free CN by Segmented Flow Analyser (QC Lot: 2575139) - continued									
ES1928334-001	BH01_0.1	EK025SF: Free Cyanide	----	1	mg/kg	<1	<1	0.00	No Limit
EK055: Ammonia as N (QC Lot: 2573726)									
ES1928334-001	BH01_0.1	EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	<20	0.00	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 2567433)									
ES1928334-001	BH01_0.1	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 2567432)									
ES1928334-001	BH01_0.1	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	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 2567432)									
ES1928334-001	BH01_0.1	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit

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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 (%)*
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 2567432) - continued									
ES1928334-001	BH01_0.1	EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 2567431)									
ES1928334-001	BH01_0.1	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2567431)									
ES1928334-001	BH01_0.1	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	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

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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: 2567431) - continued									
ES1928334-001	BH01_0.1	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
EP075A: Phenolic Compounds (QC Lot: 2567428)									
ES1928334-003	BH02_0.1	EP075: Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 3- & 4-Methylphenol	1319-77-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Pentachlorophenol	87-86-5	1	mg/kg	<1	<1	0.00	No Limit
EP075B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2567428)									
ES1928334-003	BH02_0.1	EP075: Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2-Methylnaphthalene	91-57-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2-Chloronaphthalene	91-58-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: N-2-Fluorenyl Acetamide	53-96-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 7.12-Dimethylbenz(a)anthracene	57-97-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 3-Methylcholanthrene	56-49-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg	<1	<1	0.00	No Limit
EP075C: Phthalate Esters (QC Lot: 2567428)									
ES1928334-003	BH02_0.1	EP075: Dimethyl phthalate	131-11-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

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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 (%)*
EP075C: Phthalate Esters (QC Lot: 2567428) - continued									
ES1928334-003	BH02_0.1	EP075: Diethyl phthalate	84-66-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Di-n-butyl phthalate	84-74-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Butyl benzyl phthalate	85-68-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Di-n-octylphthalate	117-84-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075D: Nitrosamines (QC Lot: 2567428)									
ES1928334-003	BH02_0.1	EP075: N-Nitrosomethylethylamine	10595-95-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: N-Nitrosodiethylamine	55-18-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: N-Nitrosopyrrolidine	930-55-2	0.5	mg/kg	<1.0	<1.0	0.00	No Limit
		EP075: N-Nitrosomorpholine	59-89-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: N-Nitrosodi-n-propylamine	621-64-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: N-Nitrosopiperidine	100-75-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: N-Nitrosodibutylamine	924-16-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: N-Nitrosodiphenyl & Diphenylamine	86-30-6 122-39-4	0.5	mg/kg	<1.0	<1.0	0.00	No Limit
		EP075: Methapyrilene	91-80-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075E: Nitroaromatics and Ketones (QC Lot: 2567428)									
ES1928334-003	BH02_0.1	EP075: 2-Picoline	109-06-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Acetophenone	98-86-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Nitrobenzene	98-95-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Isophorone	78-59-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2.6-Dinitrotoluene	606-20-2	0.5	mg/kg	<1.0	<1.0	0.00	No Limit
		EP075: 2.4-Dinitrotoluene	121-14-2	0.5	mg/kg	<1.0	<1.0	0.00	No Limit
		EP075: 1-Naphthylamine	134-32-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 4-Nitroquinoline-N-oxide	56-57-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 5-Nitro-o-toluidine	99-55-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 1.3.5-Trinitrobenzene	99-35-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Phenacetin	62-44-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 4-Aminobiphenyl	92-67-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Pentachloronitrobenzene	82-68-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Pronamide	23950-58-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Dimethylaminoazobenzene	60-11-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Chlorobenzilate	510-15-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Azobenzene	103-33-3	1	mg/kg	<1	<1	0.00	No Limit
EP075F: Haloethers (QC Lot: 2567428)									
ES1928334-003	BH02_0.1	EP075: Bis(2-chloroethyl) ether	111-44-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Bis(2-chloroethoxy) methane	111-91-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 4-Chlorophenyl phenyl ether	7005-72-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 4-Bromophenyl phenyl ether	101-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075G: Chlorinated Hydrocarbons (QC Lot: 2567428)									

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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 (%)*
EP075G: Chlorinated Hydrocarbons (QC Lot: 2567428) - continued									
ES1928334-003	BH02_0.1	EP075: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Hexachloroethane	67-72-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Hexachloropropylene	1888-71-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Pentachlorobenzene	608-93-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Hexachlorobenzene (HCB)	118-74-1	0.5	mg/kg	<1.0	<1.0	0.00	No Limit
		EP075: Hexachlorocyclopentadiene	77-47-4	2.5	mg/kg	<2.5	<2.5	0.00	No Limit
EP075H: Anilines and Benzidines (QC Lot: 2567428)									
ES1928334-003	BH02_0.1	EP075: Aniline	62-53-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 4-Chloroaniline	106-47-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2-Nitroaniline	88-74-4	0.5	mg/kg	<1.0	<1.0	0.00	No Limit
		EP075: 3-Nitroaniline	99-09-2	0.5	mg/kg	<1.0	<1.0	0.00	No Limit
		EP075: Dibenzofuran	132-64-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 4-Nitroaniline	100-01-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Carbazole	86-74-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 3.3`-Dichlorobenzidine	91-94-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075I: Organochlorine Pesticides (QC Lot: 2567428)									
ES1928334-003	BH02_0.1	EP075: alpha-BHC	319-84-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: beta-BHC	319-85-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: gamma-BHC	58-89-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: delta-BHC	319-86-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Heptachlor	76-44-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Aldrin	309-00-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Heptachlor epoxide	1024-57-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: alpha-Endosulfan	959-98-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 4.4`-DDE	72-55-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Dieldrin	60-57-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Endrin	72-20-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: beta-Endosulfan	33213-65-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 4.4`-DDD	72-54-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Endosulfan sulfate	1031-07-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 4.4`-DDT	50-29-3	0.5	mg/kg	<1.0	<1.0	0.00	No Limit
EP075J: Organophosphorus Pesticides (QC Lot: 2567428)									
ES1928334-003	BH02_0.1	EP075: Dichlorvos	62-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Dimethoate	60-51-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Diazinon	333-41-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Chlorpyrifos-methyl	5598-13-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075J: Organophosphorus Pesticides (QC Lot: 2567428) - continued									
ES1928334-003	BH02_0.1	EP075: Malathion	121-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Fenthion	55-38-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Chlorpyrifos	2921-88-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Pirimphos-ethyl	23505-41-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Chlorfenvinphos	470-90-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Prothiofos	34643-46-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Ethion	563-12-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2567430)									
ES1928334-001	BH01_0.1	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	190	130	34.9	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2568240)									
ES1928334-001	BH01_0.1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1928334-016	QCA100	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2567430)									
ES1928334-001	BH01_0.1	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	220	150	34.2	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: 2568240)									
ES1928334-001	BH01_0.1	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1928334-016	QCA100	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 2568240)									
ES1928334-001	BH01_0.1	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1928334-016	QCA100	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020T: Total Metals by ICP-MS (QC Lot: 2570760)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 2570760) - continued									
EN1906107-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.003	0.002	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.278	0.274	1.37	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.008	0.007	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.248	0.245	1.52	0% - 20%
ES1928443-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2570766)									
EN1906134-002	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
ES1928304-002	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2570216)									
EB1923089-004	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
ES1928451-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2570216)									
EB1923089-004	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
ES1928451-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 2570216)									
EB1923089-004	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
ES1928451-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

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Client	:	GOLDER ASSOCIATES
Project	:	19126714

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
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2568948)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	103	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	101	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	93.7	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	98.4	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	106	80	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2568949)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	83.1	70	105
EK025SF: Free CN by Segmented Flow Analyser (QCLot: 2575139)								
EK025SF: Free Cyanide	----	1	mg/kg	<1	40 mg/kg	123	93	123
EK055: Ammonia as N (QCLot: 2573726)								
EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	125 mg/kg	92.6	84	104
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 2567433)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	118	62	126
EP068A: Organochlorine Pesticides (OC) (QCLot: 2567432)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	94.9	69	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	94.4	65	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	102	67	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	101	68	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	106	65	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	96.1	67	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	106	69	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	100	62	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	97.9	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	97.2	64	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	92.3	66	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	98.8	67	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	85.4	67	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	96.9	69	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	94.2	69	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	94.6	56	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	97.3	62	124

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Work Order : ES1928334
Client : GOLDER ASSOCIATES
Project : 19126714

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP068A: Organochlorine Pesticides (OC) (QCLot: 2567432) - continued								
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	92.2	66	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	102	64	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	86.0	54	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2567432)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	77.3	59	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	80.6	62	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	90.1	54	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	97.0	67	119
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	96.5	70	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	92.0	72	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	87.9	68	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	82.2	68	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	87.3	69	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	90.8	76	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	85.7	64	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	90.9	70	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	80.5	69	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	89.1	66	118
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	108	68	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	96.3	62	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	83.1	68	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	93.0	65	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	67.6	41	123
EP075(SIM)A: Phenolic Compounds (QCLot: 2567431)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	6 mg/kg	101	71	125
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	6 mg/kg	98.6	72	124
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	6 mg/kg	87.4	71	123
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	12 mg/kg	90.7	67	127
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	6 mg/kg	62.3	54	114
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	6 mg/kg	89.3	68	126
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	6 mg/kg	85.7	66	120
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	6 mg/kg	87.1	70	120
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	6 mg/kg	81.7	70	116
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	6 mg/kg	82.2	54	114
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	6 mg/kg	84.6	60	114
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	12 mg/kg	19.8	10	57
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2567431)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	103	77	125

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Work Order : ES1928334
Client : GOLDER ASSOCIATES
Project : 19126714

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2567431) - continued								
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	101	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	106	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	101	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	107	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	95.8	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	108	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	106	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	99.0	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	102	75	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	105	68	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	119	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	103	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	112	61	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	110	62	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	110	63	121
EP075A: Phenolic Compounds (QCLot: 2567428)								
EP075: Phenol	108-95-2	0.5	mg/kg	<0.5	1.5 mg/kg	83.7	64	114
EP075: 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	1.5 mg/kg	75.4	57	115
EP075: 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	1.5 mg/kg	76.8	55	117
EP075: 3- & 4-Methylphenol	1319-77-3	0.5	mg/kg	<0.5	1.5 mg/kg	78.5	46	122
EP075: 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	1.5 mg/kg	73.7	47	117
EP075: 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	1.5 mg/kg	61.7	14	108
EP075: 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	1.5 mg/kg	72.4	47	105
EP075: 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	1.5 mg/kg	93.2	48	110
EP075: 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	1.5 mg/kg	95.6	57	113
EP075: 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	1.5 mg/kg	84.7	49	109
EP075: 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	1.5 mg/kg	74.5	49	107
EP075: Pentachlorophenol	87-86-5	1	mg/kg	<1	3 mg/kg	15.0	12	76
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 2567428)								
EP075: Naphthalene	91-20-3	0.5	mg/kg	<0.5	1.5 mg/kg	104	62	118
EP075: 2-Methylnaphthalene	91-57-6	0.5	mg/kg	<0.5	1.5 mg/kg	99.8	58	116
EP075: 2-Chloronaphthalene	91-58-7	0.5	mg/kg	<0.5	1.5 mg/kg	95.0	54	112
EP075: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	1.5 mg/kg	101	56	114
EP075: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	1.5 mg/kg	101	62	112
EP075: Fluorene	86-73-7	0.5	mg/kg	<0.5	1.5 mg/kg	98.8	59	115
EP075: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	1.5 mg/kg	98.0	63	113
EP075: Anthracene	120-12-7	0.5	mg/kg	<0.5	1.5 mg/kg	99.0	57	111
EP075: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	1.5 mg/kg	101	58	114

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Client : GOLDER ASSOCIATES
Project : 19126714

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 2567428) - continued								
EP075: Pyrene	129-00-0	0.5	mg/kg	<0.5	1.5 mg/kg	102	57	117
EP075: N-2-Fluorenyl Acetamide	53-96-3	0.5	mg/kg	<0.5	1.5 mg/kg	107	58	114
EP075: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	1.5 mg/kg	102	59	115
EP075: Chrysene	218-01-9	0.5	mg/kg	<0.5	1.5 mg/kg	109	61	117
EP075: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg	<1	3 mg/kg	99.6	57	119
EP075: 7.12-Dimethylbenz(a)anthracene	57-97-6	0.5	mg/kg	<0.5	1.5 mg/kg	98.3	48	106
EP075: Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	1.5 mg/kg	103	56	116
EP075: 3-Methylcholanthrene	56-49-5	0.5	mg/kg	<0.5	1.5 mg/kg	92.4	50	116
EP075: Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	1.5 mg/kg	97.0	55	117
EP075: Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	1.5 mg/kg	95.2	53	119
EP075: Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	1.5 mg/kg	101	56	120
EP075C: Phthalate Esters (QCLot: 2567428)								
EP075: Dimethyl phthalate	131-11-3	0.5	mg/kg	<0.5	1.5 mg/kg	102	60	118
EP075: Diethyl phthalate	84-66-2	0.5	mg/kg	<0.5	1.5 mg/kg	100	65	115
EP075: Di-n-butyl phthalate	84-74-2	0.5	mg/kg	<0.5	1.5 mg/kg	100	65	121
EP075: Butyl benzyl phthalate	85-68-7	0.5	mg/kg	<0.5	1.5 mg/kg	104	62	116
EP075: bis(2-ethylhexyl) phthalate	117-81-7	----	mg/kg	----	1.5 mg/kg	98.3	69	133
EP075: Di-n-octylphthalate	117-84-0	0.5	mg/kg	<0.5	1.5 mg/kg	97.6	62	124
EP075D: Nitrosamines (QCLot: 2567428)								
EP075: N-Nitrosomethylethylamine	10595-95-6	0.5	mg/kg	<0.5	1.5 mg/kg	78.0	39	124
EP075: N-Nitrosodiethylamine	55-18-5	0.5	mg/kg	<0.5	1.5 mg/kg	105	59	117
EP075: N-Nitrosopyrrolidine	930-55-2	0.5	mg/kg	<0.5	1.5 mg/kg	84.4	53	125
EP075: N-Nitrosomorpholine	59-89-2	0.5	mg/kg	<0.5	1.5 mg/kg	86.0	65	121
EP075: N-Nitrosodi-n-propylamine	621-64-7	0.5	mg/kg	<0.5	1.5 mg/kg	85.4	59	123
EP075: N-Nitrosopiperidine	100-75-4	0.5	mg/kg	<0.5	1.5 mg/kg	81.0	57	115
EP075: N-Nitrosodibutylamine	924-16-3	0.5	mg/kg	<0.5	1.5 mg/kg	96.2	57	119
EP075: N-Nitrosodiphenyl & Diphenylamine	86-30-6 122-39-4	0.5	mg/kg	<0.6	3 mg/kg	97.9	42	112
EP075: Methapyrilene	91-80-5	0.5	mg/kg	<0.5	1.5 mg/kg	55.4	16	123
EP075E: Nitroaromatics and Ketones (QCLot: 2567428)								
EP075: 2-Picoline	109-06-8	0.5	mg/kg	<0.5	1.5 mg/kg	91.9	27	129
EP075: Acetophenone	98-86-2	0.5	mg/kg	<0.5	1.5 mg/kg	84.0	60	116
EP075: Nitrobenzene	98-95-3	0.5	mg/kg	<0.5	1.5 mg/kg	84.4	65	119
EP075: Isophorone	78-59-1	0.5	mg/kg	<0.5	1.5 mg/kg	81.4	62	116
EP075: 2.6-Dinitrotoluene	606-20-2	0.5	mg/kg	<0.5	1.5 mg/kg	100	58	118
EP075: 2.4-Dinitrotoluene	121-14-2	0.5	mg/kg	<0.5	1.5 mg/kg	98.4	59	115
EP075: 1-Naphthylamine	134-32-7	0.5	mg/kg	<0.5	1.5 mg/kg	52.3	18	112

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Client : GOLDER ASSOCIATES
Project : 19126714

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075E: Nitroaromatics and Ketones (QCLot: 2567428) - continued								
EP075: 4-Nitroquinoline-N-oxide	56-57-5	0.5	mg/kg	<0.5	1.5 mg/kg	76.8	10	87
EP075: 5-Nitro-o-toluidine	99-55-8	0.5	mg/kg	<0.5	1.5 mg/kg	# 108	48	99
EP075: Azobenzene	103-33-3	1	mg/kg	<1	1.5 mg/kg	101	62	118
EP075: 1.3.5-Trinitrobenzene	99-35-4	0.5	mg/kg	<0.5	1.5 mg/kg	77.2	36	114
EP075: Phenacetin	62-44-2	0.5	mg/kg	<0.5	1.5 mg/kg	105	62	114
EP075: 4-Aminobiphenyl	92-67-1	0.5	mg/kg	<0.5	1.5 mg/kg	86.5	36	102
EP075: Pentachloronitrobenzene	82-68-8	0.5	mg/kg	<0.5	1.5 mg/kg	95.4	56	110
EP075: Pronamide	23950-58-5	0.5	mg/kg	<0.5	1.5 mg/kg	96.4	54	110
EP075: Dimethylaminoazobenzene	60-11-7	0.5	mg/kg	<0.5	1.5 mg/kg	96.2	48	108
EP075: Chlorobenzilate	510-15-6	0.5	mg/kg	<0.5	1.5 mg/kg	99.8	57	112
EP075F: Haloethers (QCLot: 2567428)								
EP075: Bis(2-chloroethyl) ether	111-44-4	0.5	mg/kg	<0.5	1.5 mg/kg	83.7	63	121
EP075: Bis(2-chloroethoxy) methane	111-91-1	0.5	mg/kg	<0.5	1.5 mg/kg	81.4	59	115
EP075: 4-Chlorophenyl phenyl ether	7005-72-3	0.5	mg/kg	<0.5	1.5 mg/kg	97.3	58	112
EP075: 4-Bromophenyl phenyl ether	101-55-3	0.5	mg/kg	<0.5	1.5 mg/kg	94.5	58	110
EP075G: Chlorinated Hydrocarbons (QCLot: 2567428)								
EP075: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1.5 mg/kg	97.1	58	112
EP075: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1.5 mg/kg	98.1	58	116
EP075: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1.5 mg/kg	79.2	57	115
EP075: Hexachloroethane	67-72-1	0.5	mg/kg	<0.5	1.5 mg/kg	80.6	54	116
EP075: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1.5 mg/kg	83.6	63	108
EP075: Hexachloropropylene	1888-71-7	0.5	mg/kg	<0.5	1.5 mg/kg	93.3	39	110
EP075: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1.5 mg/kg	97.0	59	117
EP075: Hexachlorocyclopentadiene	77-47-4	2.5	mg/kg	<2.5	1.5 mg/kg	47.4	24	108
EP075: Pentachlorobenzene	608-93-5	0.5	mg/kg	<0.5	1.5 mg/kg	97.4	57	109
EP075: Hexachlorobenzene (HCB)	118-74-1	0.5	mg/kg	<0.5	1.5 mg/kg	96.4	59	111
EP075H: Anilines and Benzidines (QCLot: 2567428)								
EP075: Aniline	62-53-3	0.5	mg/kg	<0.5	1.5 mg/kg	80.7	13	108
EP075: 4-Chloroaniline	106-47-8	0.5	mg/kg	<0.5	1.5 mg/kg	56.5	21	99
EP075: 2-Nitroaniline	88-74-4	0.5	mg/kg	<0.5	1.5 mg/kg	104	52	112
EP075: 3-Nitroaniline	99-09-2	0.5	mg/kg	<0.5	1.5 mg/kg	87.5	32	94
EP075: Dibenzofuran	132-64-9	0.5	mg/kg	<0.5	1.5 mg/kg	101	60	110
EP075: 4-Nitroaniline	100-01-6	0.5	mg/kg	<0.5	1.5 mg/kg	99.2	42	112
EP075: Carbazole	86-74-8	0.5	mg/kg	<0.5	1.5 mg/kg	98.2	59	111
EP075: 3.3`-Dichlorobenzidine	91-94-1	0.5	mg/kg	<0.5	1.5 mg/kg	91.2	23	113
EP075I: Organochlorine Pesticides (QCLot: 2567428)								
EP075: alpha-BHC	319-84-6	0.5	mg/kg	<0.5	1.5 mg/kg	101	63	113
EP075: beta-BHC	319-85-7	0.5	mg/kg	<0.5	1.5 mg/kg	87.5	57	113

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Project : 19126714

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075I: Organochlorine Pesticides (QCLot: 2567428) - continued								
EP075: gamma-BHC	58-89-9	0.5	mg/kg	<0.5	1.5 mg/kg	97.1	61	117
EP075: delta-BHC	319-86-8	0.5	mg/kg	<0.5	1.5 mg/kg	96.2	64	118
EP075: Heptachlor	76-44-8	0.5	mg/kg	<0.5	1.5 mg/kg	93.9	55	115
EP075: Aldrin	309-00-2	0.5	mg/kg	<0.5	1.5 mg/kg	96.0	61	115
EP075: Heptachlor epoxide	1024-57-3	0.5	mg/kg	<0.5	1.5 mg/kg	98.2	56	118
EP075: alpha-Endosulfan	959-98-8	0.5	mg/kg	<0.5	1.5 mg/kg	93.2	65	125
EP075: 4.4`-DDE	72-55-9	0.5	mg/kg	<0.5	1.5 mg/kg	98.7	60	116
EP075: Dieldrin	60-57-1	0.5	mg/kg	<0.5	1.5 mg/kg	99.1	64	118
EP075: Endrin	72-20-8	0.5	mg/kg	<0.5	1.5 mg/kg	101	53	117
EP075: beta-Endosulfan	33213-65-9	0.5	mg/kg	<0.5	1.5 mg/kg	104	65	115
EP075: 4.4`-DDD	72-54-8	0.5	mg/kg	<0.5	1.5 mg/kg	98.5	62	118
EP075: Endosulfan sulfate	1031-07-8	0.5	mg/kg	<0.5	1.5 mg/kg	116	63	129
EP075: 4.4`-DDT	50-29-3	0.5	mg/kg	<0.5	1.5 mg/kg	99.1	46	122
EP075: Sum of DDD + DDE + DDT	72-54-8/72-5 5-9/50-2	0.5	mg/kg	<0.5	----	----	----	----
EP075: Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.5	mg/kg	<0.5	----	----	----	----
EP075J: Organophosphorus Pesticides (QCLot: 2567428)								
EP075: Dichlorvos	62-73-7	0.5	mg/kg	<0.5	1.5 mg/kg	# 27.7	46	112
EP075: Dimethoate	60-51-5	0.5	mg/kg	<0.5	1.5 mg/kg	100	63	119
EP075: Diazinon	333-41-5	0.5	mg/kg	<0.5	1.5 mg/kg	99.9	68	134
EP075: Chlorpyrifos-methyl	5598-13-0	0.5	mg/kg	<0.5	1.5 mg/kg	96.7	60	130
EP075: Malathion	121-75-5	0.5	mg/kg	<0.5	1.5 mg/kg	117	65	127
EP075: Fenthion	55-38-9	0.5	mg/kg	<0.5	1.5 mg/kg	99.9	60	116
EP075: Chlorpyrifos	2921-88-2	0.5	mg/kg	<0.5	1.5 mg/kg	98.6	63	113
EP075: Pirimphos-ethyl	23505-41-1	0.5	mg/kg	<0.5	1.5 mg/kg	95.8	65	115
EP075: Chlorfenvinphos	470-90-6	0.5	mg/kg	<0.5	1.5 mg/kg	87.2	59	103
EP075: Prothiofos	34643-46-4	0.5	mg/kg	<0.5	1.5 mg/kg	102	59	119
EP075: Ethion	563-12-2	0.5	mg/kg	<0.5	1.5 mg/kg	113	62	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2567430)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	112	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	107	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	112	71	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2568240)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	106	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2567430)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	108	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	109	74	138

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Client : GOLDER ASSOCIATES
Project : 19126714

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2567430) - continued								
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	108	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2568240)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	103	68	128
EP080: BTEXN (QCLot: 2568240)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	112	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	107	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	110	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	110	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	112	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	110	63	119

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 2570760)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	97.3	82	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	97.2	84	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	94.4	86	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	92.0	83	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	91.8	85	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	93.6	84	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	93.2	79	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2570766)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	93.8	77	111
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2568557)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	70.6	50	94
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	67.8	64	114
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	66.8	62	113
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	81.3	64	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	73.0	63	116
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	69.1	64	116
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	86.3	64	118
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	87.5	63	118
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	74.4	64	117
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	83.4	63	116
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	79.1	62	119
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	72.1	63	115

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2568557) - continued								
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	78.2	63	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	75.0	60	118
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	77.7	61	117
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	78.3	59	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2568558)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	92.4	56	112
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	97.8	72	113
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	77.7	56	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2570216)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	90.0	75	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2568558)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	2500 µg/L	88.5	58	119
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	87.8	63	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1500 µg/L	105	62	121
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2570216)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	86.0	75	127
EP080: BTEXN (QCLot: 2570216)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	93.8	70	122
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	93.5	69	123
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	91.2	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	86.4	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	88.8	72	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	103	70	120

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2568948)							
ES1928039-052	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	78.6	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	98.2	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	77.1	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	98.9	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	96.3	70	130

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Client : GOLDER ASSOCIATES
Project : 19126714

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
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2568948) - continued							
ES1928039-052	Anonymous	EG005T: Nickel	7440-02-0	50 mg/kg	99.0	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	99.9	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2568949)							
ES1928039-052	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	78.2	70	130
EK025SF: Free CN by Segmented Flow Analyser (QCLot: 2575139)							
ES1928334-001	BH01_0.1	EK025SF: Free Cyanide	----	40 mg/kg	97.1	70	130
EK055: Ammonia as N (QCLot: 2573726)							
ES1928334-001	BH01_0.1	EK055: Ammonia as N	7664-41-7	125 mg/kg	89.0	70	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 2567433)							
ES1928334-001	BH01_0.1	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	116	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 2567432)							
ES1928334-001	BH01_0.1	EP068: gamma-BHC	58-89-9	0.5 mg/kg	118	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	83.8	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	90.9	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	84.7	70	130
		EP068: Endrin	72-20-8	2 mg/kg	88.0	70	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	116	70	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2567432)							
ES1928334-001	BH01_0.1	EP068: Diazinon	333-41-5	0.5 mg/kg	104	70	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	80.4	70	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	88.2	70	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	86.4	70	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	79.0	70	130
EP075(SIM)A: Phenolic Compounds (QCLot: 2567431)							
ES1928334-001	BH01_0.1	EP075(SIM): Phenol	108-95-2	10 mg/kg	99.1	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	97.2	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	72.9	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	85.4	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	70.5	20	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2567431)							
ES1928334-001	BH01_0.1	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	101	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	102	70	130
EP075A: Phenolic Compounds (QCLot: 2567428)							
ES1928334-003	BH02_0.1	EP075: Phenol	108-95-2	10 mg/kg	72.5	60	130
		EP075: 2-Chlorophenol	95-57-8	10 mg/kg	63.7	60	130
		EP075: 2-Nitrophenol	88-75-5	10 mg/kg	98.7	50	130

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Recovery Limits (%): Low	Recovery Limits (%): High
EP075A: Phenolic Compounds (QCLot: 2567428) - continued							
ES1928334-003	BH02_0.1	EP075: 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	97.3	50	130
		EP075: Pentachlorophenol	87-86-5	10 mg/kg	82.5	10	130
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 2567428)							
ES1928334-003	BH02_0.1	EP075: Acenaphthene	83-32-9	10 mg/kg	102	50	130
		EP075: Pyrene	129-00-0	10 mg/kg	104	50	130
EP075D: Nitrosamines (QCLot: 2567428)							
ES1928334-003	BH02_0.1	EP075: N-Nitrosodi-n-propylamine	621-64-7	10 mg/kg	87.5	50	130
EP075E: Nitroaromatics and Ketones (QCLot: 2567428)							
ES1928334-003	BH02_0.1	EP075: 2.4-Dinitrotoluene	121-14-2	10 mg/kg	95.7	40	130
EP075G: Chlorinated Hydrocarbons (QCLot: 2567428)							
ES1928334-003	BH02_0.1	EP075: 1.4-Dichlorobenzene	106-46-7	10 mg/kg	102	60	130
		EP075: 1.2.4-Trichlorobenzene	120-82-1	10 mg/kg	103	50	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2567430)							
ES1928334-001	BH01_0.1	EP071: C10 - C14 Fraction	----	523 mg/kg	100	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	119	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	118	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2568240)							
ES1928334-001	BH01_0.1	EP080: C6 - C9 Fraction	----	32.5 mg/kg	87.5	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2567430)							
ES1928334-001	BH01_0.1	EP071: >C10 - C16 Fraction	----	860 mg/kg	111	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	122	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	97.4	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2568240)							
ES1928334-001	BH01_0.1	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	84.6	70	130
EP080: BTEXN (QCLot: 2568240)							
ES1928334-001	BH01_0.1	EP080: Benzene	71-43-2	2.5 mg/kg	85.3	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	80.6	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	80.6	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	80.0	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	82.4	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	84.3	70	130

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Recovery Limits (%): Low	Recovery Limits (%): High

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Client	:	GOLDER ASSOCIATES
Project	:	19126714

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG020T: Total Metals by ICP-MS (QCLot: 2570760)							
EN1906134-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	91.2	70	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	93.6	70	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	100	70	130
		EG020A-T: Copper	7440-50-8	1 mg/L	# Not Determined	70	130
		EG020A-T: Lead	7439-92-1	1 mg/L	100	70	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	88.9	70	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	89.7	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2570766)							
EN1906134-003	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	82.0	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2570216)							
EB1923089-004	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	123	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2570216)							
EB1923089-004	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	108	70	130
EP080: BTEXN (QCLot: 2570216)							
EB1923089-004	Anonymous	EP080: Benzene	71-43-2	25 µg/L	83.9	70	130
		EP080: Toluene	108-88-3	25 µg/L	82.6	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	83.3	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	83.6	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	86.5	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	91.4	70	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1928334**	Page	: 1 of 12
Client	: **GOLDER ASSOCIATES**	Laboratory	: Environmental Division Sydney
Contact	: MR THEODORE ADCOCK	Telephone	: +61-2-8784 8555
Project	: 19126714	Date Samples Received	: 04-Sep-2019
Site	: Waverton Bowling Club	Issue Date	: 11-Sep-2019
Sampler	: THEODORE ADCOCK	No. of samples received	: 20
Order number	: PO22402	No. of samples analysed	: 17

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.**
- **Duplicate outliers exist - please see following pages for full details.**
- **Laboratory Control outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **Surrogate recovery outliers exist for all regular sample matrices - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

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							
EG005(ED093)T: Total Metals by ICP-AES	ES1928515--002	Anonymous	**Zinc**	7440-66-6	24.0 %	0% - 20%	**RPD exceeds LOR based limits**
Laboratory Control Spike (LCS) Recoveries							
EP075E: Nitroaromatics and Ketones	QC-2567428-002	----	**5-Nitro-o-toluidine**	99-55-8	108 %	48-99%	**Recovery greater than upper control limit**
EP075J: Organophosphorus Pesticides	QC-2567428-002	----	**Dichlorvos**	62-73-7	27.7 %	46-112%	**Recovery less than lower control limit**

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EG020T: Total Metals by ICP-MS	EN1906134--001	Anonymous	**Copper**	7440-50-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Regular Sample Surrogates

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP075S: Acid Extractable Surrogates	ES1928334-012	BH05_0.9	**2-Fluorophenol**	367-12-4	8.07 %	29-149 %	**Recovery less than lower data quality objective**
EP075S: Acid Extractable Surrogates	ES1928334-012	BH05_0.9	**Phenol-d6**	13127-88-3	10.8 %	32-128 %	**Recovery less than lower data quality objective**
EP075S: Acid Extractable Surrogates	ES1928334-012	BH05_0.9	**2-Chlorophenol-D4**	93951-73-6	20.0 %	32-128 %	**Recovery less than lower data quality objective**
EP075S: Acid Extractable Surrogates	ES1928334-012	BH05_0.9	**2.4.6-Tribromophenol**	118-79-6	9.52 %	13-121 %	**Recovery less than lower data quality objective**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	10	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	20	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	10	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	20	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

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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)								
BH01_0.1,	BH02_0.5,	**02-Sep-2019**	**----**	----	----	**06-Sep-2019**	16-Sep-2019	✓
BH04_0.5,	BH05_0.1,							
Trans01,	QCA100							
Soil Glass Jar - Unpreserved (EA055)								
BH02_0.1,	BH03_0.1,	**02-Sep-2019**	**----**	----	----	**09-Sep-2019**	16-Sep-2019	✓
BH03_0.5,	BH04_0.1,							
BH04_0.8,	BH05_0.9							
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Snap Lock Bag: Separate bag received (EA200)								
BH01_0.1,	BH03_0.1,	**02-Sep-2019**	**----**	----	----	**09-Sep-2019**	29-Feb-2020	✓
BH05_0.1,	Trans01							
EA200N: Asbestos Quantification (non-NATA)								
Snap Lock Bag: Separate bag received (EA200N)								
BH01_0.1,	BH03_0.1,	**02-Sep-2019**	**----**	----	----	**09-Sep-2019**	29-Feb-2020	✓
BH05_0.1,	Trans01							
EG005(ED093)T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)								
BH01_0.1,	BH02_0.5,	**02-Sep-2019**	**06-Sep-2019**	29-Feb-2020	✓	**06-Sep-2019**	29-Feb-2020	✓
BH04_0.5,	BH05_0.1,							
Trans01,	QCA100							
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T)								
BH01_0.1,	BH02_0.5,	**02-Sep-2019**	**06-Sep-2019**	30-Sep-2019	✓	**09-Sep-2019**	30-Sep-2019	✓
BH04_0.5,	BH05_0.1,							
Trans01,	QCA100							
EK025SF: Free CN by Segmented Flow Analyser								
Soil Glass Jar - Unpreserved (EK025SF)								
BH01_0.1,	BH02_0.5,	**02-Sep-2019**	**10-Sep-2019**	16-Sep-2019	✓	**11-Sep-2019**	24-Sep-2019	✓
BH03_0.5,	BH04_0.8,							
BH05_0.9,	QCA100							

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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
EK055: Ammonia as N							
Soil Glass Jar - Unpreserved (EK055)							
BH01_0.1, BH02_0.5, BH03_0.5, BH04_0.8, BH05_0.9, QCA100	**02-Sep-2019**	**----**	----	----	**10-Sep-2019**	29-Feb-2020	✓
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066)							
BH01_0.1, BH02_0.5, BH04_0.5, BH05_0.1, Trans01, QCA100	**02-Sep-2019**	**06-Sep-2019**	16-Sep-2019	✓	**09-Sep-2019**	16-Oct-2019	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068)							
BH01_0.1, BH02_0.5, BH04_0.5, BH05_0.1, Trans01, QCA100	**02-Sep-2019**	**06-Sep-2019**	16-Sep-2019	✓	**09-Sep-2019**	16-Oct-2019	✓
EP068B: Organophosphorus Pesticides (OP)							
Soil Glass Jar - Unpreserved (EP068)							
BH01_0.1, BH02_0.5, BH04_0.5, BH05_0.1, Trans01, QCA100	**02-Sep-2019**	**06-Sep-2019**	16-Sep-2019	✓	**09-Sep-2019**	16-Oct-2019	✓
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved (EP075(SIM))							
BH01_0.1, BH02_0.5, BH04_0.5, BH05_0.1, Trans01, QCA100	**02-Sep-2019**	**06-Sep-2019**	16-Sep-2019	✓	**09-Sep-2019**	16-Oct-2019	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
BH01_0.1, BH02_0.5, BH04_0.5, BH05_0.1, Trans01, QCA100	**02-Sep-2019**	**06-Sep-2019**	16-Sep-2019	✓	**09-Sep-2019**	16-Oct-2019	✓
EP075A: Phenolic Compounds							
Soil Glass Jar - Unpreserved (EP075)							
BH02_0.1, BH03_0.1, BH04_0.1, BH04_0.8, BH05_0.9	**02-Sep-2019**	**06-Sep-2019**	16-Sep-2019	✓	**09-Sep-2019**	16-Oct-2019	✓
EP075B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075)							
BH02_0.1, BH03_0.1, BH04_0.1, BH04_0.8, BH05_0.9	**02-Sep-2019**	**06-Sep-2019**	16-Sep-2019	✓	**09-Sep-2019**	16-Oct-2019	✓

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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
EP075C: Phthalate Esters							
Soil Glass Jar - Unpreserved (EP075)							
BH02_0.1, BH03_0.1, BH04_0.1, BH04_0.8, BH05_0.9	**02-Sep-2019**	**06-Sep-2019**	16-Sep-2019	✓	**09-Sep-2019**	16-Oct-2019	✓
EP075D: Nitrosamines							
Soil Glass Jar - Unpreserved (EP075)							
BH02_0.1, BH03_0.1, BH04_0.1, BH04_0.8, BH05_0.9	**02-Sep-2019**	**06-Sep-2019**	16-Sep-2019	✓	**09-Sep-2019**	16-Oct-2019	✓
EP075E: Nitroaromatics and Ketones							
Soil Glass Jar - Unpreserved (EP075)							
BH02_0.1, BH03_0.1, BH04_0.1, BH04_0.8, BH05_0.9	**02-Sep-2019**	**06-Sep-2019**	16-Sep-2019	✓	**09-Sep-2019**	16-Oct-2019	✓
EP075F: Haloethers							
Soil Glass Jar - Unpreserved (EP075)							
BH02_0.1, BH03_0.1, BH04_0.1, BH04_0.8, BH05_0.9	**02-Sep-2019**	**06-Sep-2019**	16-Sep-2019	✓	**09-Sep-2019**	16-Oct-2019	✓
EP075G: Chlorinated Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075)							
BH02_0.1, BH03_0.1, BH04_0.1, BH04_0.8, BH05_0.9	**02-Sep-2019**	**06-Sep-2019**	16-Sep-2019	✓	**09-Sep-2019**	16-Oct-2019	✓
EP075H: Anilines and Benzidines							
Soil Glass Jar - Unpreserved (EP075)							
BH02_0.1, BH03_0.1, BH04_0.1, BH04_0.8, BH05_0.9	**02-Sep-2019**	**06-Sep-2019**	16-Sep-2019	✓	**09-Sep-2019**	16-Oct-2019	✓
EP075I: Organochlorine Pesticides							
Soil Glass Jar - Unpreserved (EP075)							
BH02_0.1, BH03_0.1, BH04_0.1, BH04_0.8, BH05_0.9	**02-Sep-2019**	**06-Sep-2019**	16-Sep-2019	✓	**09-Sep-2019**	16-Oct-2019	✓
EP075J: Organophosphorus Pesticides							
Soil Glass Jar - Unpreserved (EP075)							
BH02_0.1, BH03_0.1, BH04_0.1, BH04_0.8, BH05_0.9	**02-Sep-2019**	**06-Sep-2019**	16-Sep-2019	✓	**09-Sep-2019**	16-Oct-2019	✓

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Client : GOLDER ASSOCIATES
Project : 19126714

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) BH01_0.1, BH02_0.5, BH04_0.5, BH05_0.1, Trans01, QCA100	**02-Sep-2019**	**06-Sep-2019**	16-Sep-2019	✓	**06-Sep-2019**	16-Sep-2019	✓
Soil Glass Jar - Unpreserved (EP071) BH01_0.1, BH02_0.5, BH04_0.5, BH05_0.1, Trans01, QCA100	**02-Sep-2019**	**06-Sep-2019**	16-Sep-2019	✓	**09-Sep-2019**	16-Oct-2019	✓
Soil Glass Jar - Unpreserved (EP080) TS, Trip Spike Control	**28-Aug-2019**	**06-Sep-2019**	11-Sep-2019	✓	**06-Sep-2019**	11-Sep-2019	✓
Soil Glass Jar - Unpreserved (EP080) TB	**30-Aug-2019**	**06-Sep-2019**	13-Sep-2019	✓	**06-Sep-2019**	13-Sep-2019	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080) BH01_0.1, BH02_0.5, BH04_0.5, BH05_0.1, Trans01, QCA100	**02-Sep-2019**	**06-Sep-2019**	16-Sep-2019	✓	**06-Sep-2019**	16-Sep-2019	✓
Soil Glass Jar - Unpreserved (EP071) BH01_0.1, BH02_0.5, BH04_0.5, BH05_0.1, Trans01, QCA100	**02-Sep-2019**	**06-Sep-2019**	16-Sep-2019	✓	**09-Sep-2019**	16-Oct-2019	✓
Soil Glass Jar - Unpreserved (EP080) TS, Trip Spike Control	**28-Aug-2019**	**06-Sep-2019**	11-Sep-2019	✓	**06-Sep-2019**	11-Sep-2019	✓
Soil Glass Jar - Unpreserved (EP080) TB	**30-Aug-2019**	**06-Sep-2019**	13-Sep-2019	✓	**06-Sep-2019**	13-Sep-2019	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) BH01_0.1, BH02_0.5, BH04_0.5, BH05_0.1, Trans01, QCA100	**02-Sep-2019**	**06-Sep-2019**	16-Sep-2019	✓	**06-Sep-2019**	16-Sep-2019	✓
Soil Glass Jar - Unpreserved (EP080) TS, Trip Spike Control	**28-Aug-2019**	**06-Sep-2019**	11-Sep-2019	✓	**06-Sep-2019**	11-Sep-2019	✓
Soil Glass Jar - Unpreserved (EP080) TB	**30-Aug-2019**	**06-Sep-2019**	13-Sep-2019	✓	**06-Sep-2019**	13-Sep-2019	✓

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples							
Snap Lock Bag: Separate bag received (EA200) ASB01	**02-Sep-2019**	**----**	----	----	**09-Sep-2019**	29-Feb-2020	✓

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

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Work Order : ES1928334
Client : GOLDER ASSOCIATES
Project : 19126714

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)							
RB	**02-Sep-2019**	**08-Sep-2019**	29-Feb-2020	✓	**08-Sep-2019**	29-Feb-2020	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
RB	**02-Sep-2019**	**----**	----	----	**09-Sep-2019**	30-Sep-2019	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
RB	**02-Sep-2019**	**09-Sep-2019**	09-Sep-2019	✓	**10-Sep-2019**	19-Oct-2019	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
RB	**02-Sep-2019**	**09-Sep-2019**	09-Sep-2019	✓	**10-Sep-2019**	19-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
RB	**02-Sep-2019**	**09-Sep-2019**	16-Sep-2019	✓	**09-Sep-2019**	16-Sep-2019	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071)							
RB	**02-Sep-2019**	**09-Sep-2019**	09-Sep-2019	✓	**10-Sep-2019**	19-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
RB	**02-Sep-2019**	**09-Sep-2019**	16-Sep-2019	✓	**09-Sep-2019**	16-Sep-2019	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080)							
RB	**02-Sep-2019**	**09-Sep-2019**	16-Sep-2019	✓	**09-Sep-2019**	16-Sep-2019	✓

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Work Order : ES1928334
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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)							
Buchi Ammonia	EK055	1	8	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Free Cyanide by Segmented Flow Analyser	EK025SF	1	6	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	4	40	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	6	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	6	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	6	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	1	5	20.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	6	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Buchi Ammonia	EK055	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Free Cyanide by Segmented Flow Analyser	EK025SF	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	1	5	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Buchi Ammonia	EK055	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Free Cyanide by Segmented Flow Analyser	EK025SF	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	1	5	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Buchi Ammonia	EK055	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Free Cyanide by Segmented Flow Analyser	EK025SF	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard

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Work Order : ES1928334
Client : GOLDER ASSOCIATES
Project : 19126714

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	
Matrix Spikes (MS) - Continued							
PAH/Phenols (SIM)	EP075(SIM)	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	1	5	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	10	0.00	10.00	×	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	20	0.00	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 (GC/MS - SIM)	EP075(SIM)	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	10	0.00	5.00	×	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	20	0.00	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
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
Asbestos Classification and Quantitation per NEPM 2013	* EA200N	SOIL	Asbestos Classification and Quantitation per NEPM 2013 with Confirmation of Identification by AS 4964 - 2004 Gravimetric determination of Asbestos Containing Material, Fibrous Asbestos, Asbestos Fines and sample weight and calculation of percentage concentrations per NEPM protocols. Asbestos (Fines and Fibrous FA+AF) is reported as the equivalent weight in the sample received after accounting for sub-sampling (where applicable for the <7mm and/or <2mm fractions).
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)
Free Cyanide by Segmented Flow Analyser	EK025SF	SOIL	In house: Referenced to ASTM D7237: Using an automated segmented flow analyser, a sample at high pH (caustic leach of a soil) is buffered to pH 6.0. The hydrogen cyanide present passes across a gas dialysis membrane into an acceptor stream consisting of 0.01 M sodium hydroxide. The acceptor stream mixes with a buffer at pH 5.2 and reacts with chloramine-T to form cyanogen chloride. Cyanogen chloride reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour. This is measured at 600nm. This method is compliant with NEPM (2013) Schedule B(3)
Buchi Ammonia	EK055	SOIL	In house: Referenced to APHA 4500-NH3 B&G, H Samples are steam distilled (Buchi) prior to analysis and quantified using titration, FIA or Discrete Analyser.
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.
Semivolatile Organic Compounds	EP075	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 502)

Analytical Methods	Method	Matrix	Method Descriptions
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.
Asbestos Identification in Bulk Solids	EA200	SOLID	In house: Referenced to AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	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. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
NaOH leach for CN in Soils	CN-PR	SOIL	In house: APHA 4500 CN. Samples are extracted by end-over-end tumbling with NaOH.
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.
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

QOC 4/9 3:14pm.

CHAIN OF CUSTODY FORM - Client

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08 8967 1201 | darwin@envirolab.com.au

Client: Golder Associates
Contact Person: Theo Adcock
Project Mgr: Shane Doyle
Sampler: Theo Adcock
Address:
Level 8, 40 Mount Street
North Sydney NSW 2060
Phone: Mob: 0434 196 861
Email: tadcock@golder.com.au
sdoyle@golder.com.au

Client Project Name/Number/Site etc (ie report title):
Waverton 19126714
PO No.: PO22403
Envirolab Quote No. :
Date results required: Standard T/A
Or choose: standard / same day / 1 day / 2 day / 3 day
Note: Inform lab in advance if urgent turnaround is required - surcharges apply
Additional report format: esdat / equis /
Lab Comments:

Sample information					Tests Required														Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Combination 8														Provide as much information about the sample as you can
	QCB100		2/09/2019	Soil	X														

☐ *Please tick the box if observed settled sediment present in water samples is to be included in the extraction and/or analysis*

Relinquished by (Company): Theo Adcock	Received by (Company):	*Lab Use Only*	
Print Name: Theo Adcock	Print Name:	Job number:	Cooling: Ice / Ice pack / None
Date & Time: 3/9/2019	Date & Time:	Temperature:	Security seal: Intact / Broken / None
Signature:	Signature:	TAT Req - SAME day / 1 / 2 / 3 / 4 / STD	

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Golder Associates Pty Ltd
Attention	T Adcock, Shane Doyle

Sample Login Details

Your reference	19126714, Waverton Bowling Club
Envirolab Reference	225635
Date Sample Received	06/09/2019
Date Instructions Received	06/09/2019
Date Results Expected to be Reported	On Hold

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	16.2
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	VHC's in soil	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticidesin soil	Organophosphorus Pesticides	PCBsin Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Misc Inorg - Soil	Asbestos ID - soils	On Hold
QCB100												✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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CERTIFICATE OF ANALYSIS 225635

Client Details

Client	Golder Associates Pty Ltd
Attention	T Adcock, Shane Doyle
Address	124 Pacific Highway, St Leonards, NSW, 2065

Sample Details

Your Reference	**19126714, Waverton Bowling Club**
Number of Samples	1 Soil
Date samples received	06/09/2019
Date completed instructions received	06/09/2019

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	13/09/2019
Date of Issue	13/09/2019

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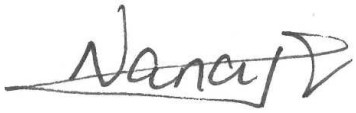
Results Approved By
Diego Bigolin, Team Leader, Inorganics
Jaimie Loa-Kum-Cheung, Metals Supervisor
Josh Williams, Chemist
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		225635-1
Your Reference	UNITS	QCB100
Date Sampled		02/09/2019
Type of sample		Soil
Date extracted	-	10/09/2019
Date analysed	-	12/09/2019
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<3
Surrogate aaa-Trifluorotoluene	%	97

svTRH (C10-C40) in Soil		
Our Reference		225635-1
Your Reference	UNITS	QCB100
Date Sampled		02/09/2019
Type of sample		Soil
Date extracted	-	10/09/2019
Date analysed	-	11/09/2019
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	190
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50
TRH >C_{16} -C_{34}	mg/kg	<100
TRH >C_{34} -C_{40}	mg/kg	220
Total +ve TRH (>C10-C40)	mg/kg	220
Surrogate o-Terphenyl	%	82

PAHs in Soil		
Our Reference		225635-1
Your Reference	UNITS	QCB100
Date Sampled		02/09/2019
Type of sample		Soil
Date extracted	-	10/09/2019
Date analysed	-	10/09/2019
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Surrogate p-Terphenyl-d14	%	107

Organochlorine Pesticides in soil		
Our Reference		225635-1
Your Reference	UNITS	QCB100
Date Sampled		02/09/2019
Type of sample		Soil
Date extracted	-	10/09/2019
Date analysed	-	10/09/2019
HCB	mg/kg	<0.1
alpha-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	86

Organophosphorus Pesticides		
Our Reference		225635-1
Your Reference	UNITS	QCB100
Date Sampled		02/09/2019
Type of sample		Soil
Date extracted	-	10/09/2019
Date analysed	-	10/09/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Chlorpyriphos	mg/kg	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Dichlorvos	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Ethion	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Parathion	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Surrogate TCMX	%	86

PCBs in Soil		
Our Reference		225635-1
Your Reference	UNITS	QCB100
Date Sampled		02/09/2019
Type of sample		Soil
Date extracted	-	10/09/2019
Date analysed	-	10/09/2019
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate TCMX	%	86

Acid Extractable metals in soil		
Our Reference		225635-1
Your Reference	UNITS	QCB100
Date Sampled		02/09/2019
Type of sample		Soil
Date prepared	-	10/09/2019
Date analysed	-	10/09/2019
Arsenic	mg/kg	4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	6
Copper	mg/kg	6
Lead	mg/kg	8
Mercury	mg/kg	1.0
Nickel	mg/kg	4
Zinc	mg/kg	18

Misc Soil - Inorg		
Our Reference		225635-1
Your Reference	UNITS	QCB100
Date Sampled		02/09/2019
Type of sample		Soil
Date prepared	-	10/09/2019
Date analysed	-	10/09/2019
Total Phenolics (as Phenol)	mg/kg	<5

Moisture		
Our Reference		225635-1
Your Reference	UNITS	QCB100
Date Sampled		02/09/2019
Type of sample		Soil
Date prepared	-	10/09/2019
Date analysed	-	11/09/2019
Moisture	%	15

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.

Method ID	Methodology Summary
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			10/09/2019	1	10/09/2019	10/09/2019		10/09/2019	[NT]
Date analysed	-			12/09/2019	1	12/09/2019	12/09/2019		12/09/2019	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	1	<25	<25	0	87	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	1	<25	<25	0	87	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	77	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	91	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	91	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	87	[NT]
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	85	[NT]
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	104	1	97	99	2	99	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			10/09/2019	1	10/09/2019	10/09/2019		10/09/2019	[NT]
Date analysed	-			10/09/2019	1	11/09/2019	11/09/2019		10/09/2019	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	1	<50	<50	0	95	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	1	<100	<100	0	89	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	1	190	170	11	92	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	1	<50	<50	0	92	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	1	<100	<100	0	89	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	1	220	200	10	92	[NT]
Surrogate o-Terphenyl	%		Org-003	81	1	82	81	1	93	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			10/09/2019	1	10/09/2019	10/09/2019		10/09/2019	[NT]
Date analysed	-			10/09/2019	1	10/09/2019	10/09/2019		10/09/2019	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	124	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	108	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	110	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	112	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	115	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	107	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	1	<0.05	<0.05	0	121	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	115	1	107	104	3	106	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			10/09/2019	1	10/09/2019	10/09/2019		10/09/2019	[NT]
Date analysed	-			10/09/2019	1	10/09/2019	10/09/2019		10/09/2019	[NT]
HCB	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	85	[NT]
gamma-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	86	[NT]
Heptachlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	81	[NT]
delta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	88	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	90	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	87	[NT]
Dieldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	104	[NT]
Endrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	89	[NT]
pp-DDD	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	80	[NT]
Endosulfan II	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	76	[NT]
Methoxychlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	90	1	86	87	1	87	[NT]

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			10/09/2019	1	10/09/2019	10/09/2019		10/09/2019	[NT]
Date analysed	-			10/09/2019	1	10/09/2019	10/09/2019		10/09/2019	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	90	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	90	[NT]
Dimethoate	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	84	[NT]
Fenitrothion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	92	[NT]
Malathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	98	[NT]
Parathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	108	[NT]
Ronnel	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	85	[NT]
Surrogate TCMX	%		Org-008	90	1	86	87	1	87	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			10/09/2019	1	10/09/2019	10/09/2019		10/09/2019	[NT]
Date analysed	-			10/09/2019	1	10/09/2019	10/09/2019		10/09/2019	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	104	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-006	90	1	86	87	1	87	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date prepared	-			10/09/2019	1	10/09/2019	10/09/2019		10/09/2019	[NT]
Date analysed	-			10/09/2019	1	10/09/2019	10/09/2019		10/09/2019	[NT]
Arsenic	mg/kg	4	Metals-020	<4	1	4	4	0	99	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	97	[NT]
Chromium	mg/kg	1	Metals-020	<1	1	6	7	15	104	[NT]
Copper	mg/kg	1	Metals-020	<1	1	6	6	0	101	[NT]
Lead	mg/kg	1	Metals-020	<1	1	8	8	0	110	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	1	1.0	1.0	0	91	[NT]
Nickel	mg/kg	1	Metals-020	<1	1	4	4	0	97	[NT]
Zinc	mg/kg	1	Metals-020	<1	1	18	18	0	103	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date prepared	-			10/09/2019	[NT]	[NT]	[NT]	[NT]	10/09/2019	[NT]
Date analysed	-			10/09/2019	[NT]	[NT]	[NT]	[NT]	10/09/2019	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[NT]	[NT]	[NT]	[NT]	105	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

APPENDIX J

Summary Table

TABLE J1 SUMMARY OF SOIL ANALYSIS RESULTS

FORMER WAVERTON BOWLING CLUB SITE
NORTH SYDNEY COUNCIL

Statistical Summary

ChemName	output unit	EQL	Recreational Open Space EIL/ESL	Recreational Open Space HIL/HSL															Number of Results	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Number of Guideline Exceedances	Number of Guideline Exceedances (Detects Only)
				Location_Code	BH01	BH01	BH01	BH02	BH02	BH03	BH03	BH04	BH04	BH04	BH05	BH05	Trans01	ASB01								
				Sample_Depth_Range	0.1	0.1	0.1	0.1	0.5	0.1	0.5	0.1	0.5	0.8	0.1	0.9										
				Sampled_Date_Time	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019								
				Field_ID	BH01_0.1	QCA100	QCB100	BH02_0.1	BH02_0.5	BH03_0.1	BH03_0.5	BH04_0.1	BH04_0.5	BH04_0.8	BH05_0.1	BH05_0.9	Trans01	ASB01								
Asbestos																										
Asbestos in soil (>7mm ACM)	%w/w	0.01		**0.02**	<0.01	-	-	-	-	<0.01	-	-	-	-	<0.01	-	**0.13**	-	4	1	<0.01	0.13	0.13	0.13	1	1
Asbestos in soil (<7mm AF/FA)	%w/w	0.001		**0.001**	<0.001	-	-	-	-	<0.001	-	-	-	-	<0.001	-	<0.001	-	4	0	<0.001	ND	<0.001	ND		
Weight Asbestos in soil (>7mm ACM)	g	0.1			<0.1	-	-	-	-	<0.1	-	-	-	-	<0.1	-	6.6	-	4	1	<0.1	6.6	6.6	6.6		
Weight Asbestos in soil (<7mm AF/FA)	g	0.0004			<0.0004	-	-	-	-	<0.0004	-	-	-	-	<0.0004	-	<0.0004	-	4	0	<0.0004	ND	<0.0004	ND		
Asbestos Type	No				-	-	-	-	-	-	-	-	-	-	-	-	#4	#5	3	-	-	-	-	-		
Asbestos (1-Detect or <1-Non-Detect)	g/kg	0.1			ND	-	-	-	-	ND	-	-	-	-	ND	-	YES	YES	5	2	-	-	-	-		
Asbestos Fines	fibres	5			ND	-	-	-	-	ND	-	-	-	-	ND	-	ND	-	4	0	-	-	-	-		
Description	--				#2	-	-	-	-	#2	-	-	-	-	#2	-	#1	-	0	-	-	-	-	-		
Fibrous Asbestos	mg/kg	0.0004			<0.0004	-	-	-	-	<0.0004	-	-	-	-	<0.0004	-	<0.0004	-	4	0	<0.0004	ND	<0.0004	ND		
Mass of test sample	g	0.1			488	-	-	-	-	539	-	-	-	-	529	-	749	38	5	5	488	38	749	749		
Sample weight (dry)	g	0.01			488	-	-	-	-	539	-	-	-	-	529	-	749	38	5	5	488	38	749	749		
Inorganic compounds																										
Ammonia (as N)	mg/kg	20			<20	<20	-	-	<20	-	<20	-	-	<20	-	<20	-	-	6	0	<20	ND	<20	ND		
Cyanide (free)	mg/kg	1		**240**	<1	<1	-	-	<1	-	<1	-	-	<1	-	<1	-	-	6	0	<1	ND	<1	ND	0	0
TRH - HSL																										
TRH C6 - C10 Fraction F1	mg/kg	10			<10	<10	<25	-	<10	-	-	-	<10	-	<10	-	<10	-	7	0	<10	ND	<25	ND		
TRH C6 - C10 Fraction Less BTEX F1	mg/kg	10	**180**	**700**	<10	<10	<25	-	<10	-	-	-	<10	-	<10	-	<10	-	7	0	<10	ND	<25	ND	0	0
TRH >C10 - C16 Fraction F2	mg/kg	50	**120**		<50	<50	<50	-	<50	-	-	-	<50	-	<50	-	<50	-	7	0	<50	ND	<50	ND	0	0
TRH >C10 - C16 Fraction Less Naphthalene (F2)	mg/kg	50		**1000**	<50	<50	<50	-	<50	-	-	-	<50	-	<50	-	<50	-	7	0	<50	ND	<50	ND	0	0
TRH >C16 - C34 Fraction F3	mg/kg	100	**300**	**2500**	<100	<100	<100	-	<100	-	-	-	<100	-	<100	-	170	-	7	1	<100	170	170	170	0	0
TRH >C34 - C40 Fraction F4	mg/kg	100	**2800**	**7400**	220	280	220	-	<100	-	-	-	<100	-	<100	-	<100	-	7	3	<100	220	280	280	0	0
TRH+C10 - C40 (Sum of total) (Lab Reported)	mg/kg	50			220	280	220	-	<50	-	-	-	<50	-	<50	-	170	-	7	4	<50	170	280	280		
BTEX																										
Benzene	mg/kg	0.2	**50**		<0.2	<0.2	<0.2	-	<0.2	-	-	-	<0.2	-	<0.2	-	<0.2	-	7	0	<0.2	ND	<0.2	ND	0	0
Toluene	mg/kg	0.5	**85**		<0.5	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	-	<0.5	-	7	0	<0.5	ND	<0.5	ND	0	0
Ethylbenzene	mg/kg	0.5	**70**		<0.5	<0.5	<1	-	<0.5	-	-	-	<0.5	-	<0.5	-	<0.5	-	7	0	<0.5	ND	<1	ND	0	0
Xylenes (m & p)	mg/kg	0.5			<0.5	<0.5	<2	-	<0.5	-	-	-	<0.5	-	<0.5	-	<0.5	-	7	0	<0.5	ND	<2	ND		
Xylene (o)	mg/kg	0.5			<0.5	<0.5	<1	-	<0.5	-	-	-	<0.5	-	<0.5	-	<0.5	-	7	0	<0.5	ND	<1	ND		
Xylenes (Sum of total) (Lab Reported)	mg/kg	0.5	**45**		<0.5	<0.5	<3	-	<0.5	-	-	-	<0.5	-	<0.5	-	<0.5	-	7	0	<0.5	ND	<3	ND	0	0
Total BTEX	mg/kg	0.2			<0.2	<0.2	-	-	<0.2	-	-	-	<0.2	-	<0.2	-	<0.2	-	6	0	<0.2	ND	<0.2	ND		
Heavy Metals																										
Arsenic	mg/kg	5	**100**	**300**	5	6	4	-	<5	-	-	-	<5	-	13	-	<5	-	7	4	4	4	13	13	0	0
Cadmium	mg/kg	1		**90**	<1	<1	<0.4	-	<1	-	-	-	<1	-	<1	-	<1	-	7	0	<0.4	ND	<1	ND	0	0
Chromium	mg/kg	2	**190**	**300**	7	7	6	-	3	-	-	-	11	-	7	-	10	-	7	7	3	3	11	11	0	0
Copper	mg/kg	5	**60**	**17000**	6	7	6	-	11	-	-	-	15	-	20	-	20	-	7	7	6	6	20	20	0	0
Lead	mg/kg	5	**1100**	**600**	8	9	8	-	6	-	-	-	<5	-	27	-	53	-	7	6	<5	6	53	53	0	0
Mercury	mg/kg	0.1		**80**	1.4	0.9	1	-	0.9	-	-	-	0.3	-	1.5	-	2.2	-	7	7	0.3	0.3	2.2	2.2	0	0
Nickel	mg/kg	2	**30**	**1200**	4	4	4	-	10	-	-	-	25	-	4	-	3	-	7	7	3	3	25	25	0	0
Zinc	mg/kg	5	**70**	**30000**	17	21	18	-	22	-	-	-	9	-	26	-	63	-	7	7	9	9	63	63	0	0
Organochlorine Pesticides																										
p,p-DDE	mg/kg	0.05			<0.05	<0.05	<0.1	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	0.11	<0.5	<0.05	-	12	1	<0.05	0.11	<0.5	0.11		
a-BHC	mg/kg	**0.05**			<0.05	<0.05	<0.1	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	<0.05	<0.5	<0.05	-	12	0	<0.05	ND	<0.5	ND		
Aldrin	mg/kg	0.05			<0.05	<0.05	<0.1	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	<0.05	<0.5	<0.05	-	12	0	<0.05	ND	<0.5	ND		
Dieldrin	mg/kg	0.05			<0.05	<0.05	<0.1	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	0.05	<0.5	0.08	-	12	2	<0.05	0.05	<0.5	0.08		
Aldrin & Dieldrin (Sum of total) (Lab Reported)	mg/kg	0.05		**10**	<0.05	<0.05	-	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	0.05	<0.5	0.08	-	11	2	<0.05	0.05	<0.5	0.08	0	0
b-BHC	mg/kg	0.05			<0.05	<0.05	<0.1	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	<0.05	<0.5	<0.05	-	12	0	<0.05	ND	<0.5	ND		
cis-Chlordane	mg/kg	0.05			<0.05	<0.05	<0.1	-	<0.05	-	-	-	<0.05	-	0.11	-	0.06	-	7	2	<0.05	0.06	0.11	0.11		
trans-Chlordane	mg/kg	0.05			<0.05	<0.05	<0.1	-	<0.05	-	-	-	<0.05	-	0.11	-	0.08	-	7	2	<0.05	0.08	0.11	0.11		
Chlordane (Sum of total)	mg/kg	0.05		**70**	<0.05	<0.05	-	-	<0.05	-	-	-	<0.05	-	0.22	-	0.14	-	6	2	<0.05	0.14	0.22	0.22	0	0
d-BHC	mg/kg	0.05			<0.05	<0.05	<0.1	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	<0.05	<0.5	<0.05	-	12	0	<0.05	ND	<0.5	ND		
DDD	mg/kg	0.05			<0.05	<0.05	<0.1	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	<0.05	<0.5	<0.05	-	12	0	<0.05	ND	<0.5	ND		
DDT	mg/kg	0.2	**180**		<0.2	<0.2	<0.1	<1	<0.2	<1	-	<1	<0.2	<1	<0.2	<1	<0.2	-	12	0	<0.1	ND	<1	ND	0	0
DDT+DDE+DDD (Sum of total) (Lab Reported)	mg/kg	0.05		**400**	<0.05	<0.05	<0.1	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	0.11	<0.5	<0.05	-	12	1	<0.05	0.11	<0.5	0.11	0	0
Endosulfan	mg/kg	0.05		**340**	<0.05	<0.05	-	-	<0.05	-	-	-	<0.05	-	<0.05	-	<0.05	-	6	0	<0.05	ND	<0.05	ND	0	0
Endosulfan I	mg/kg	0.05			<0.05	<0.05	<0.1	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	<0.05	<0.5	<0.05	-	12	0	<0.05	ND	<0.5	ND		
Endosulfan II	mg/kg	0.05			<0.05	<0.05	<0.1	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	<0.05	<0.5	<0.05	-	12	0	<0.05	ND	<0.5	ND		
Endosulfan sulphate	mg/kg	0.05			<0.05	<0.05	<0.1	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	<0.05	<0.5	<0.05	-	12	0	<0.05	ND	<0.5	ND		
Endrin	mg/kg	0.05		**20**	<0.05	<0.05	<0.1	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	<0.05	<0.5	<0.05	-	12	0	<0.05	ND	<0.5	ND	0	0
Endrin aldehyde	mg/kg	0.05			<0.05	<0.05	<0.1	-	<0.05	-	-	-	<0.05	-	<0.05	-	<0.05	-	7	0	<0.05	ND	<0.1	ND		
Endrin ketone	mg/kg	0.05			<0.05	<0.05	-	-	<0.05	-	-	-	<0.05	-	<0.05	-	<0.05	-	6	0	<0.05	ND	<0.05	ND		
g-BHC	mg/kg	0.05			<0.05	<0.05	<0.1	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	<0.05	<0.5	<0.05	-	12	0	<0.05	ND	<0.5	ND		
Heptachlor	mg/kg	0.05		**10**	<0.05	<0.05	<0.1	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	<0.05	<0.5	<0.05	-	12	0	<0.05	ND	<0.5	ND	0	0
Heptachlor epoxide	mg/kg	0.05			<0.05	<0.05	<0.1	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	<0.05	<0.5	<0.05	-	12	0	<0.05	ND	<0.5	ND		
Hexachlorobenzene	mg/kg	0.05		**10**	<0.05	<0.05	<0.1	<1	<0.05	<1	-	<1	<0.05	<1	<0.05	<1	<0.05	-	12	0	<0.05	ND	<1	ND	0	0
Methoxychlor	mg/kg	0.2		**400**	<0.2	<0.2	<0.1	-	<0.2	-	-	-	<0.2	-	<0.2	-	<0.2	-	7	0	<0.1	ND	<0.2	ND	0	0
Organophosphorous Pesticides																										
Azinphos-methyl	mg/kg	0.05			<0.05	<0.05	<0.1	-	<0.05	-	-	-	<0.05	-	<0.05	-	<0.05	-	7	0	<0.05	ND	<0.1	ND		
Bromophos-ethyl	mg/kg	0.05			<0.05	<0.05	<0.1	-	<0.05	-	-	-	<0.05	-	<0.05	-	<0.05	-	7	0	<0.05	ND	<0.1	ND		

GOLDER

TABLE J1 SUMMARY OF SOIL ANALYSIS RESULTS

FORMER WAVERTON BOWLING CLUB SITE
NORTH SYDNEY COUNCIL

				Location_Code	BH01	BH01	BH01	BH02	BH02	BH03	BH03	BH04	BH04	BH04	BH05	BH05	Trans01	ASB01								
				Sample_Depth_Range	0.1	0.1	0.1	0.1	0.5	0.1	0.5	0.1	0.5	0.8	0.1	0.9										
				Sampled_Date_Time	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	**Statistical Summary**							
				Field_ID	BH01_0.1	QCA100	QCB100	BH02_0.1	BH02_0.5	BH03_0.1	BH03_0.5	BH04_0.1	BH04_0.5	BH04_0.8	BH05_0.1	BH05_0.9	Trans01	ASB01								
ChemName	**output unit**	**EQL**	Recreational Open Space EIL/ESL	Recreational Open Space HIL/HSL															Number of Results	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Number of Guideline Exceedances	Number of Guideline Exceedances (Detects Only)
Carbophenothion	mg/kg	0.05			<0.05	<0.05	-	-	<0.05	-	-	-	<0.05	-	<0.05	-	<0.05	-	6	0	<0.05	ND	<0.05	ND		
Chlorfenvinphos	mg/kg	0.05			<0.05	<0.05	-	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	<0.05	<0.5	<0.05	-	11	0	<0.05	ND	<0.5	ND		
Chlorpyriphos	mg/kg	0.05		**250**	<0.05	<0.05	<0.1	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	<0.05	<0.5	<0.05	-	12	0	<0.05	ND	<0.5	ND	0	0
Chlorpyriphos-methyl	mg/kg	0.05			<0.05	<0.05	<0.1	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	<0.05	<0.5	<0.05	-	12	0	<0.05	ND	<0.5	ND		
Demeton-s-methyl	mg/kg	0.05			<0.05	<0.05	-	-	<0.05	-	-	-	<0.05	-	<0.05	-	<0.05	-	6	0	<0.05	ND	<0.05	ND		
Diazinon	mg/kg	0.05			<0.05	<0.05	<0.1	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	<0.05	<0.5	<0.05	-	12	0	<0.05	ND	<0.5	ND		
Dichlorvos	mg/kg	0.05			<0.05	<0.05	<0.1	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	<0.05	<0.5	<0.05	-	12	0	<0.05	ND	<0.5	ND		
Dimethoate	mg/kg	0.05			<0.05	<0.05	<0.1	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	<0.05	<0.5	<0.05	-	12	0	<0.05	ND	<0.5	ND		
Ethion	mg/kg	0.05			<0.05	<0.05	<0.1	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	<0.05	<0.5	<0.05	-	12	0	<0.05	ND	<0.5	ND		
Fenamiphos	mg/kg	0.05			<0.05	<0.05	-	-	<0.05	-	-	-	<0.05	-	<0.05	-	<0.05	-	6	0	<0.05	ND	<0.05	ND		
Fenitrothion	mg/kg	0.1			-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	1	0	<0.1	ND	<0.1	ND		
Fenthion	mg/kg	0.05			<0.05	<0.05	-	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	<0.05	<0.5	<0.05	-	11	0	<0.05	ND	<0.5	ND		
Malathion	mg/kg	0.05			<0.05	<0.05	<0.1	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	<0.05	<0.5	<0.05	-	12	0	<0.05	ND	<0.5	ND		
Parathion-methyl	mg/kg	0.2			<0.2	<0.2	-	-	<0.2	-	-	-	<0.2	-	<0.2	-	<0.2	-	6	0	<0.2	ND	<0.2	ND		
Monocrotophos	mg/kg	0.2			<0.2	<0.2	-	-	<0.2	-	-	-	<0.2	-	<0.2	-	<0.2	-	6	0	<0.2	ND	<0.2	ND		
Parathion	mg/kg	0.2			<0.2	<0.2	<0.1	-	<0.2	-	-	-	<0.2	-	<0.2	-	<0.2	-	7	0	<0.1	ND	<0.2	ND		
Pirimphos-ethyl	mg/kg	0.05			<0.05	<0.05	-	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	<0.05	<0.5	<0.05	-	11	0	<0.05	ND	<0.5	ND		
Prothiofos	mg/kg	0.05			<0.05	<0.05	-	<0.5	<0.05	<0.5	-	<0.5	<0.05	<0.5	<0.05	<0.5	<0.05	-	11	0	<0.05	ND	<0.5	ND		
Ronnel	mg/kg	0.1			-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	1	0	<0.1	ND	<0.1	ND		
PAH																										
Benzo(b+j) & Benzo(k)fluoranthene	mg/kg	1			-	-	<0.2	<1	-	<1	-	<1	-	<1	-	<1	-	-	6	0	<0.2	ND	<1	ND		
Acenaphthene	mg/kg	0.5			<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	12	0	<0.1	ND	<0.5	ND		
Acenaphthylene	mg/kg	0.5			<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	12	0	<0.1	ND	<0.5	ND		
Anthracene	mg/kg	0.5			<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	0.9	-	12	1	<0.1	0.9	0.9	0.9		
Benz(a)anthracene	mg/kg	0.5			<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	2.2	-	12	1	<0.1	2.2	2.2	2.2		
Benzo(a)pyrene	mg/kg	0.5	**0.7**		<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	**2.2**	-	12	1	<0.05	2.2	2.2	2.2	1	1
Benzo(a)pyrene TEQ (lower bound)*	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	2.9	-	12	1	<0.5	2.9	2.9	2.9		
Benzo(a)pyrene TEQ (medium bound)*	mg/kg	0.5			0.6	0.6	<0.5	0.6	0.6	0.6	-	0.6	0.6	0.6	0.6	0.6	3.2	-	12	11	<0.5	0.6	3.2	3.2		
Benzo(a)pyrene TEQ (upper bound)*	mg/kg	0.5		**3**	1.2	1.2	<0.5	1.2	1.2	1.2	-	1.2	1.2	1.2	1.2	1.2	**3.4**	-	12	11	<0.5	1.2	3.4	3.4	1	1
Benzo(b)&(j)fluoranthene	mg/kg	0.5			<0.5	<0.5	-	-	<0.5	-	-	-	<0.5	-	0.5	-	2.7	-	6	2	<0.5	0.5	2.7	2.7		
Benzo(g,h,i)perylene	mg/kg	0.5			<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.6	-	12	1	<0.1	1.6	1.6	1.6		
Benzo(k)fluoranthene	mg/kg	0.5			<0.5	<0.5	-	-	<0.5	-	-	-	<0.5	-	<0.5	-	0.9	-	6	1	<0.5	0.9	0.9	0.9		
Chrysene	mg/kg	0.5			<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	2.1	-	12	1	<0.1	2.1	2.1	2.1		
Dibenz(a,h)anthracene	mg/kg	0.5			<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	12	0	<0.1	ND	<0.5	ND		
Fluoranthene	mg/kg	0.5			<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	1.3	<0.5	4.7	-	12	2	<0.1	1.3	4.7	4.7		
Fluorene	mg/kg	0.5			<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	12	0	<0.1	ND	<0.5	ND		
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5			<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	-	12	1	<0.1	1.2	1.2	1.2		
Naphthalene	mg/kg	0.5	**170**		<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	12	0	<0.1	ND	<0.5	ND	0	0
Phenanthrene	mg/kg	0.5			<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	1	<0.5	2.2	-	12	2	<0.1	1	2.2	2.2		
Pyrene	mg/kg	0.5			<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	1.3	<0.5	4.7	-	12	2	<0.1	1.3	4.7	4.7		
PAH (Sum of Common 16 PAHs - Lab Reported)	mg/kg	0.5		**300**	<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	4.1	<0.5	25.4	-	11	2	<0.5	4.1	25.4	25.4	0	0
Total PAH (NEPM/WHO 16)	mg/kg	0.05			-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	1	0	<0.05	ND	<0.05	ND		
2-Methylnaphthalene	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
Phenols																										
Phenolics (Sum of total)	mg/kg	5			-	-	<5	-	-	-	-	-	-	-	-	-	-	-	1	0	<5	ND	<5	ND		
2,4,5-Trichlorophenol	mg/kg	0.5			<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	11	0	<0.5	ND	<0.5	ND		
2,4,6-Trichlorophenol	mg/kg	0.5			<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	11	0	<0.5	ND	<0.5	ND		
2,4-Dichlorophenol	mg/kg	0.5			<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	11	0	<0.5	ND	<0.5	ND		
2,6-Dichlorophenol	mg/kg	0.5			<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	11	0	<0.5	ND	<0.5	ND		
2-Chlorophenol	mg/kg	0.5			<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	11	0	<0.5	ND	<0.5	ND		
4-Chloro-3-methylphenol	mg/kg	0.5			<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	11	0	<0.5	ND	<0.5	ND		
Pentachlorophenol	mg/kg	1		**120**	<2	<2	-	<1	<2	<1	-	<1	<2	<1	<2	<1	<2	-	11	0	<1	ND	<2	ND	0	0
2,4-Dimethylphenol	mg/kg	0.5			<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	11	0	<0.5	ND	<0.5	ND		
2-Methylphenol	mg/kg	0.5		**4000**	<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	11	0	<0.5	ND	<0.5	ND	0	0
3- & 4- Methylphenol	mg/kg	0.5			<1	<1	-	<0.5	<1	<0.5	-	<0.5	<1	<0.5	<1	<0.5	<1	-	11	0	<0.5	ND	<1	ND	0	0
2-Nitrophenol	mg/kg	0.5			<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	11	0	<0.5	ND	<0.5	ND		
Phenol	mg/kg	0.5		**40000**	<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	11	0	<0.5	ND	<0.5	ND	0	0
Polychlorinated Biphenyls																										
Aroclor 1016	mg/kg	0.1			-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	1	0	<0.1	ND	<0.1	ND		
Aroclor 1232	mg/kg	0.1			-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	1	0	<0.1	ND	<0.1	ND		
Aroclor 1242	mg/kg	0.1			-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	1	0	<0.1	ND	<0.1	ND		
Aroclor 1248	mg/kg	0.1			-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	1	0	<0.1	ND	<0.1	ND		
Aroclor 1254	mg/kg	0.1			-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	1	0	<0.1	ND	<0.1	ND		
Aroclor 1260	mg/kg	0.1			-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	1	0	<0.1	ND	<0.1	ND		
Aroclor 1221	mg/kg	0.1			-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	1	0	<0.1	ND	<0.1	ND		
PCB (Sum of Total-Lab Reported)	mg/kg	0.1		**1**	<0.1	<0.1	<0.1	-	<0.1	-	-	-	<0.1	-	<0.1	-	<0.1	-	7	0	<0.1	ND	<0.1	ND	0	0
SVOCs																										
n-Nitrosomethylethylamine	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
n-Nitrosodiethylamine	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		

GOLDER

TABLE J1 SUMMARY OF SOIL ANALYSIS RESULTS

FORMER WAVERTON BOWLING CLUB SITE
NORTH SYDNEY COUNCIL

				Location_Code	BH01	BH01	BH01	BH02	BH02	BH03	BH03	BH04	BH04	BH04	BH05	BH05	Trans01	ASB01								
				Sample_Depth_Range	0.1	0.1	0.1	0.1	0.5	0.1	0.5	0.1	0.5	0.8	0.1	0.9										
				Sampled_Date_Time	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019								
				Field_ID	BH01_0.1	QCA100	QCB100	BH02_0.1	BH02_0.5	BH03_0.1	BH03_0.5	BH04_0.1	BH04_0.5	BH04_0.8	BH05_0.1	BH05_0.9	Trans01	ASB01								
			Recreational Open Space EIL/ESL	Recreational Open Space HIL/HSL															**Statistical Summary**							
ChemName	**output unit**	**EQL**																	Number of Results	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Number of Guideline Exceedances	Number of Guideline Exceedances (Detects Only)
N-Nitrosodi-n-butylamine	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
N-Nitrosodi-n-propylamine	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
1-Naphthylamine	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
n-Nitrosodiphenylamine & Diphenylamine	mg/kg	1			-	-	-	<1	-	<1	-	<1	-	<1	-	<1	-	-	5	0	<1	ND	<1	ND		
2-Nitroaniline	mg/kg	1			-	-	-	<1	-	<1	-	<1	-	<1	-	<1	-	-	5	0	<1	ND	<1	ND		
3-Nitroaniline	mg/kg	1			-	-	-	<1	-	<1	-	<1	-	<1	-	<1	-	-	5	0	<1	ND	<1	ND		
4-Chloroaniline	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
2-methyl-5-nitroaniline	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
4-Nitroaniline	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
Aniline	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
Nitrobenzene	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
Pentachloronitrobenzene	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
1,3,5-Trinitrobenzene	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
2,4-Dinitrotoluene	mg/kg	1			-	-	-	<1	-	<1	-	<1	-	<1	-	<1	-	-	5	0	<1	ND	<1	ND		
2,6-Dinitrotoluene	mg/kg	1			-	-	-	<1	-	<1	-	<1	-	<1	-	<1	-	-	5	0	<1	ND	<1	ND		
Pentachlorobenzene	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
Pronamide	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
2-Chloronaphthalene	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
3-Methylcholanthrene	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
7,12-Dimethylbenz(a)anthracene	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
Carbazole	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
Chlorobenzilate	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
Bis(2-ethylhexyl) phthalate	mg/kg	5			-	-	-	<5	-	<5	-	<5	-	<5	-	<5	-	-	5	0	<5	ND	<5	ND		
Butylbenzyl phthalate	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
Diethyl phthalate	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
Dimethyl phthalate	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
Di-n-butyl phthalate	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
Di-n-octyl phthalate	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
2-(Acetylamino) fluorene	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
2-Picoline	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
3,3-Dichlorobenzidine	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
4-(Dimethylamino) azobenzene	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
4-Aminobiphenyl	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
4-Bromophenyl phenyl ether	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
4-Chlorophenyl phenyl ether	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
4-Nitroquinoline-n-oxide	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
Acetophenone	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
Azobenzene	mg/kg	1			-	-	-	<1	-	<1	-	<1	-	<1	-	<1	-	-	5	0	<1	ND	<1	ND		
Bis(2-chloroethoxy) methane	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
Bis(2-chloroethyl) ether	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
Dibenzofuran	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
Hexachlorocyclopentadiene	mg/kg	2.5			-	-	-	<2.5	-	<2.5	-	<2.5	-	<2.5	-	<2.5	-	-	5	0	<2.5	ND	<2.5	ND		
Hexachloropropene	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
Methapyrilene	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
n-Nitrosomorpholine	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
N-Nitrosopiperidine	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
n-Nitrosopyrrolidine	mg/kg	1			-	-	-	<1	-	<1	-	<1	-	<1	-	<1	-	-	5	0	<1	ND	<1	ND		
Phenacetin	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
Volatile Organic Compounds																										
1,4-Dichlorobenzene	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
1,2,4-Trichlorobenzene	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
1,2-Dichlorobenzene	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
1,3-Dichlorobenzene	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
Isophorone	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
Hexachlorobutadiene	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		
Hexachloroethane	mg/kg	0.5			-	-	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	5	0	<0.5	ND	<0.5	ND		

Data Comments

#1 Mid brown soil containing one piece of asbestos cement sheeting approximately 40x40x5mm.
#2 Mid brown soil.
#3 A. SMYLIE
#4 Chrysotile + Amosite
#5 Chrysotile

APPENDIX K

Data Validation Records

GOLDER

DATA VALIDATION SUMMARY SHEET (Sydney)

Project Name:	**NSC Phase 1 ESA Waverton**	**Project Number:**	**19126714**
Primary Laboratory:	**ALS Sydney**	**Work order Number:**	**ES1928334**
Secondary Laboratory:	**Envirolab**	**Work order Number:**	**225635**
Subcontractor Laboratory:	**ALS Newcastle (Asbestos)**	**Work order Number:**	**-**
Date Sampled:	**2/09/2019**	**Sample Medium:**	**Soil**

Sample Information

Number of Primary Samples:	**10**	**Number of Triplicate Samples:**	**1**
Number of Duplicate Samples:	**1**	**Number of Other QAQC Samples:**	**3**

Documentation and Sample Handling Information

	Y/N	Comments
COC completed properly?	N	ALS: COC completed and signed by all staff. Sample BH01 0.9 recived by laboratory but not included on COC. Envirolab: COC reciept date and time recorded.
All requested analysis completed?	Y	ALS & Envirolab: All requested analyses on the COC completed.
Samples received intact and chilled?	Y	ALS: 5.3°C, ice present. Envirolab: 16.2°C, ice present. Samples received in appropriate condition for analysis.
Samples analysed within appropriate holding times?	Y	ALS & SGS: All analyses were within appropriate holding times.
Sample volumes sufficient for QC analysis?	N	ALS: Insufficient sample volume provided for LD and MS for PAH/Phenols (GC/MS - SIM) and TRH - Semi volatile Fraction in water in batch ES1928334. *Refer to overall comments.* ALS & Envirolab: Sufficient sample volume provided for all other laboratory QC analyses.
Are there non-NATA accredited methods used?	Y	ALS is not NATA accredited for asbestos weights and percentages to the reporting limits required by NEPC 2013. ALS & Envirolab: All other methods used in this batch are NATA accredited.
Chromatograms supplied as appropriate?	N/A	N/A
Laboratory reports signed by authorised personnel?	Y	All laboratory reports signed by authorised personnel.

QAQC Sample Information (Method Blank - MB, Rinsate Blank - RB, Field Blank - FB, Trip Blank - TB)

Type	Sample ID	Comments
MB	Method blank	All results were below the LOR (ALS & Envirolab).
TB	TB	All results were below the LOR (ALS).
RB	RB	All results were below the LOR (ALS).

Trip Spike Information

Analyte	Control Spike Concentrations	Trip Spike Concentration	% Recovery	Comments
Sample ID: TS				
C6-C9 Fraction	70	64	91%	Result is within data quality objectives (DQOs) (70%-130%).
C6-C10 Fraction	84	78	93%	Result is within DQOs (70%-130%).
C6-C10 Fraction minus BTEX (F1)	41	38	93%	Result is within DQOs (70%-130%).
Benzene	0.2	0.2	100%	Result is within DQOs (70%-130%).
Toluene	19.3	17.4	90%	Result is within DQOs (70%-130%).
Ethylbenzene	2.8	2.7	96%	Result is within DQOs (70%-130%).
m/p-xylene	15.2	14.4	95%	Result is within DQOs (70%-130%).
o-xylene	5.7	5.4	95%	Result is within DQOs (70%-130%).
Naphthalene	<1	<1	100%	Result is within DQOs (70%-130%).

Laboratory Control Spike (LCS) Analyses

Analyte Group	Comments
Nitroaromatics and Ketones	ALS: The LCS recovery for 5-nitro-o-toluidine (108%) was greater than the upper laboratory based DQOs (48-99%). *Refer to overall comments.*
Organophosphorus Pesticides	ALS: The LCS recovery for dichlorvos (27.7%) was less than the lower laboratory based DQOs (46-112%). *Refer to overall comments* .
-	ALS & Envirolab: All other LCS recoveries were within laboratory based DQOs.

Matrix Spike (MS) Analyses

Analyte Group	Comments
Metals	ALS: The MS recovery for copper in anonymous sample EN1906134-001 was not determined. *Refer to overall comments* .
-	ALS & Envirolab: All other MS recoveries were within laboratory based DQOs.

Laboratory Duplicates (LD) Analyses

Analyte Group	Sample ID	Comments
Metals	ES1928515-002 (Anonymous)	ALS: The LD RPD for zinc (24%) was outside of laboratory based DQOs (0-20%). *Refer to overall comments.*

Field Duplicates (FD) Analyses

Analyte Group	Primary ID	Duplicate ID	Comments
All	BH01_0.1	QCA100	All FD RPDs were within acceptable DQOs.

Field Triplicates (FT) Analyses

Analyte Group	Primary ID	Triplicate ID	Comments
All	BH01_0.1	QCB100	All FT RPDs were within acceptable DQOs.

Surrogate Compound Monitoring Analyses

Analyte Group	Analyte(s)	Comments
Acid Extractable Surrogates	2-fluorophenol	ALS: The surrogate recovery for 2-fluorophenol (8.07%) was less than laboratory DQOs (29-149%). *Refer to overall comments* .
	Phenol-d6	ALS: The surrogate recovery for phenol-d6 (10.8%) was less than laboratory DQOs (32-128%). *Refer to overall comments* .
	2-chlorophenol-D4	ALS: The surrogate recovery for 2-chlorophenol-D4 (20%) was less than laboratory DQOs (32-128%). *Refer to overall comments* .
	2.4.6-tribromophenol	ALS: The surrogate recovery for 2,4,6-tribromophenol (9.52%) was less than laboratory DQOs (13-121%). *Refer to overall comments* .
All	-	ALS & Envirolab: All surrogate recoveries were within laboratory based DQOs.

Overall Comments

ALS: The expected QC frequencies were not met for LD and MS (water) analysis of PAH/Phenols (GC/MS - SIM) and TRH - Semi volatile Fraction in water. This is not expected to affect the validity of the data set as the only water sample submitted for analysis in batch ES1928334 was a QA/QC sample (rinsate blank) and as such does not represent the primary project matrix (soil).

ALS: The LCS recovery for 5-nitro-o-toluidine (108%) was greater than the upper laboratory based DQOs (48-99%) indicating the potential for over-reporting. This is not expected to affect the validity of this data set as this exceedance is considered minor (<10%) and as concentrations of 5-nitro-o-toluidine were less than the laboratory limit of reporting for the samples analysed.

ALS: The LCS recovery for dichlorvos (27.7%) was less than the lower laboratory based DQOs (46-112%) indicating the potential for under-reporting. This is not expected to affect the validity of this data set as concentrations of dichlorvos were less than the laboratory limit of reporting for the samples analysed.

ALS: The MS recovery for copper in EN1906134-001 (Anonymous) was not determined. As stated by ALS, "MS recovery not determined, background level greater than or equal to 4x spike level." This is not expected to affect the validity of this data as this is an anonymous sample and is not expected to be representative of the sample matrix.

ALS: The LD RPD for the analyte group metals for sample ES1928515-002 (Anonymous) was outside of DQOs. This is not expected to affect the validity of this data set as the exceedance is from an anonymous sample which is unlikely to be representative of project sample matrices.

ALS: The surrogate recoveries for several Acid Extractable Surrogates was less than lower DQO s indicating the potential for under-reporting. This is not expected to affect the validity of the data set as phenols were not detected and the laborotory limits of reporting were orders of magnitude below the adopted site criteria.

This batch has been validated and is considered suitable for environmental interpretive use.

Note: Data validation assesses each analyte in terms of all the data validation variables and only the exceedances and outliers are reported in this form.

*When concentrations are less than the LOR for both primary and duplicate/triplicate results, no RPDs are calculated

Performed By: **Pauline Voukidis** **Checked By:** **Shane Doyle**
Date: **20/09/2019** **Date:** **23/09/2019**

Project: NSC Phase 1 ESA Waverton
Duplicate Analysis RPDs
Project No. : 19126714
Batch/es: ES1928334 & 225635

Sample ID	BH01_0.1	QCA100	QCB100	
Sample Type	Primary	Field Duplicate	Field Triplicate	
Date Sampled	2/09/2019	2/09/2019	2/09/2019	

						RPDs	
Chem Name	**output unit**	**LOR**				Primary vs Duplicate	Primary vs Triplicate
Inorganic compounds							
Ammonia (as N)	mg/kg	20	<20	<20	-	ND	-
Cyanide (free)	mg/kg	1	<1	<1	-	ND	-
Moisture							
Moisture	%	0.1	11.6	12.8	15	10%	26%
TRH-HSL							
TRH C6 - C10 Fraction F1	mg/kg	10	<10	<10	<25	ND	ND
TRH C6 - C10 Fraction Less BTEX F1	mg/kg	10	<10	<10	<25	ND	ND
TRH >C10 - C16 Fraction F2	mg/kg	50	<50	<50	<50	ND	ND
TRH >C10 - C16 Fraction Less Naphthalene (F2)	mg/kg	50	<50	<50	<50	ND	ND
TRH >C16 - C34 Fraction F3	mg/kg	100	<100	<100	<100	ND	ND
TRH >C34 - C40 Fraction F4	mg/kg	100	220	280	220	24%	0%
TRH+C10 - C40 (Sum of total) (Lab Reported)	mg/kg	50	220	280	220	24%	0%
TPH							
TRH C6 - C9 Fraction	mg/kg	10	<10	<10	<25	ND	ND
TRH C10 - C14 Fraction	mg/kg	50	<50	<50	<50	ND	ND
TRH C15 - C28 Fraction	mg/kg	100	<100	<100	<100	ND	ND
TRH C29 - C36 Fraction	mg/kg	100	190	240	190	23%	0%
TRH+C10 - C36 (Sum of total) (Lab Reported)	mg/kg	50	190	240	-	23%	-
BTEX							
Benzene	mg/kg	0.2	<0.2	<0.2	<0.2	ND	ND
Toluene	mg/kg	0.5	<0.5	<0.5	<0.5	ND	ND
Ethylbenzene	mg/kg	0.5	<0.5	<0.5	<1	ND	ND
Xylenes (m & p)	mg/kg	0.5	<0.5	<0.5	<2	ND	ND
Xylene (o)	mg/kg	0.5	<0.5	<0.5	<1	ND	ND
Xylenes (Sum of total) (Lab Reported)	mg/kg	0.5	<0.5	<0.5	<3	ND	ND
Total BTEX	mg/kg	0.2	<0.2	<0.2	-	ND	-
Metals							
Arsenic	mg/kg	5	5	6	4	18%	22%
Cadmium	mg/kg	1	<1	<1	<0.4	ND	ND
Chromium	mg/kg	2	7	7	6	0%	15%
Copper	mg/kg	5	6	7	6	15%	0%
Lead	mg/kg	5	8	9	8	12%	0%
Mercury	mg/kg	0.1	1.4	0.9	1	43%	33%
Nickel	mg/kg	2	4	4	4	0%	0%
Zinc	mg/kg	5	17	21	18	21%	6%
Organochlorine Pesticides							
p,p-DDE	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
a-BHC	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Aldrin	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Dieldrin	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Aldrin & Dieldrin (Sum of total) (Lab Reported)	mg/kg	0.05	<0.05	<0.05	-	ND	-
b-BHC	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
cis-Chlordane	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
trans-Chlordane	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Chlordane (Sum of total)	mg/kg	0.05	<0.05	<0.05	-	ND	-
d-BHC	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
DDD	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
DDT	mg/kg	0.2	<0.2	<0.2	<0.1	ND	ND
DDT+DDE+DDD (Sum of total) (Lab Reported)	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Endosulfan	mg/kg	0.05	<0.05	<0.05	-	ND	-
Endosulfan I	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Endosulfan II	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Endosulfan sulphate	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Endrin	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Endrin aldehyde	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Endrin ketone	mg/kg	0.05	<0.05	<0.05	-	ND	-
g-BHC	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Heptachlor	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Heptachlor epoxide	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Hexachlorobenzene	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Methoxychlor	mg/kg	0.2	<0.2	<0.2	<0.1	ND	ND
Organophosphorous Pesticides							
Azinphos-methyl	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Bromophos-ethyl	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Carbophenothion	mg/kg	0.05	<0.05	<0.05	-	ND	-
Chlorfenvinphos	mg/kg	0.05	<0.05	<0.05	-	ND	-
Chlorpyriphos	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Chlorpyriphos-methyl	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Demeton-s-methyl	mg/kg	0.05	<0.05	<0.05	-	ND	-
Diazinon	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Dichlorvos	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Dimethoate	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Ethion	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Fenamiphos	mg/kg	0.05	<0.05	<0.05	-	ND	-
Fenthion	mg/kg	0.05	<0.05	<0.05	-	ND	-
Malathion	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Parathion-methyl	mg/kg	0.2	<0.2	<0.2	-	ND	-
Monocrotophos	mg/kg	0.2	<0.2	<0.2	-	ND	-
Parathion	mg/kg	0.2	<0.2	<0.2	<0.1	ND	ND
Pirimphos-ethyl	mg/kg	0.05	<0.05	<0.05	-	ND	-
Prothiofos	mg/kg	0.05	<0.05	<0.05	-	ND	-
PAH							
Acenaphthene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Acenaphthylene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Anthracene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Benz(a)anthracene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND

Created by: PV 20/9/2019
Checked by: SPD/23/9/2019

Project: NSC Phase 1 ESA Waverton
Duplicate Analysis RPDs
Project No. : 19126714
Batch/es: ES1928334 & 225635

Sample ID	BH01_0.1	QCA100	QCB100
Sample Type	Primary	Field Duplicate	Field Triplicate
Date Sampled	2/09/2019	2/09/2019	2/09/2019

Chem Name	**output unit**	**LOR**				RPDs	
						Primary vs Duplicate	Primary vs Triplicate
Benzo(a)pyrene	mg/kg	0.5	<0.5	<0.5	<0.05	ND	ND
Benzo(a)pyrene TEQ (lower bound)*	mg/kg	0.5	<0.5	<0.5	<0.5	ND	ND
Benzo(a)pyrene TEQ (medium bound)*	mg/kg	0.5	0.6	0.6	<0.5	0%	18%
Benzo(a)pyrene TEQ (upper bound)*	mg/kg	0.5	1.2	1.2	<0.5	0%	82%
Benzo(b)&(j)fluoranthene	mg/kg	0.5	<0.5	<0.5	-	ND	-
Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	-	ND	-
Chrysene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Fluoranthene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Fluorene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Naphthalene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Phenanthrene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Pyrene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
PAH (Sum of Common 16 PAHs - Lab Reported)	mg/kg	0.5	<0.5	<0.5	-	ND	-
Phenols							
2,4,5-Trichlorophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
2,4,6-Trichlorophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
2,4-Dichlorophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
2,6-Dichlorophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
2-Chlorophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
4-Chloro-3-methylphenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
Pentachlorophenol	mg/kg	1	<2	<2	-	ND	-
2,4-Dimethylphenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
2-Methylphenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
3- & 4- Methylphenol	mg/kg	0.5	<1	<1	-	ND	-
2-Nitrophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
Phenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
Polychlorinated Biphenyls							
PCB (Sum of Total-Lab Reported)	mg/kg	0.1	<0.1	<0.1	<0.1	ND	ND

Legend
ND = Not Detected (RPDs not calculated if both primary and duplicate results are below LOR)
- = Not analysed/calculated
Indicates RPD result does not meet the acceptable criteria
Acceptable RPDs: RPD <= 30%
RPD > 30%, Analysis result < 10 times LOR
RPD <= 50%, Analysis result > 10 times LOR and < 20 times LOR

Created by: PV 20/9/2019
Checked by: SPD/23/9/2019

APPENDIX L

Limitations

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Stage 1 Engagement Outcomes Report

Ex-Waverton Bowling Club Site

In accordance with the adopted Engagement Strategy (May 2019), Council is seeking community feedback regarding the potential future public use of the site, should a more permanent tenure arrangement be attained. Engagement will occur in two stages.

Stage 1 was undertaken from 27 June to 24 July 2019 and involved Council inviting key stakeholders to provide suggestions regarding proposed use of the site, to inform the Stage 2 wider engagement. We received a total of 61 emails, from the following stakeholders:

- 7 from Sport and Recreation Reference Group members, including sporting clubs and one individual
- 1 from Waverton Peninsula Working Group
- 5 from Precinct Committees
- 1 from Waverton Hub
- 27 from local residents, including individual members of Precinct Committees (of this total, 14 contained similar content/form submission)
- 20 other (no address provided for confirmation as to whether are local resident), of this total, 11 contained similar content/form submission)

Note: the purpose of the Stage 1 engagement was to seek suggested preferred uses of the site; not to quantify feedback/preference for the options suggested.

Council staff collated and analysed submissions. There was a broad range of uses suggested, however, regardless of the preferred use, the **unified theme of submissions was that the site needs to remain as public land and meet community needs.**

Feedback included a broad range of suggested uses for the site, with many requests for a combination of the following:

- Active recreation:
    - Sports facilities:
      - multipurpose synthetic surface
      - futsal or small sided courts
      - netball
      - cricket nets
      - tennis
      - volleyball
      - basketball
      - lawn bowls - bare foot bowls/casual bowls
      - boules area
      - hand ball
      - badmington
    - Indoor sports/basketball stadium
    - Outdoor gym/exercise station
    - Temporary plastic pool to give some swimming facility whilst NSOP is out of action, along with Lane Cove and Willoughby pools

- Passive recreation:
    - Community garden/allotments - examples Camperdown Commons (by Pocket City Farms). Long waitlist for a lot at the Coal Loader community garden

- Picnic facilities, BBQ, benches, tables with shade protection
- Outdoor chess, ping pong (bring your own bat)
- Natural amphitheatre, that can be used for community performances/recitals, occasional outdoor cinema
- Water feature/foundation
- Rose or fruit garden (on part of the site)
- Urban forest - add to the habitat and wildlife corridors in the area

- New multipurpose community facility/centre (with multi-generational focus):
  - Club house for sporting group
  - Commercial opportunity for café/coffee shop/restaurant/brasserie/bistro (or training facility e.g. TAFE or café using the products of the garden) with preference for outdoor deck area facing the harbour to take advantage of the harbour/city views or childcare/early learning centre
  - Creative hub including art gallery and performance space
  - Meeting rooms - for use by local groups and individuals e.g. Precinct Committees, The Waverton Hub, U3A, mothers groups, book clubs, bridge clubs, classes such as art, dance, cooking, knitting, quilting, health/fitness (e.g. yoga, tai chi, Zumba, strength and balance, table tennis, snooker, card tables), lectures/talks
  - Venue for private function hire e.g. weddings, parties, exhibitions, performances polling station (elections), hire by schools
  - Aboriginal restaurant/cultural facility/market

- Playground:
  - Relocate existing Wetherill Park playground
  - Fenced area
  - Different zones for different aged kids
  - New children's water play facilities/park to cool off in summer
  - New children's bike/scooter track
  - New amenities with parent/child toilet cubical, nappy change station

Other issues raised:

- Needs to remain as public land and meet community needs
- If the existing building is not fit for adaptive reuse, therefore a new building would be preferred over renovation/upgrade of the existing
- Demolition and re-incorporated back into surrounding park
- Funding required to build new facilities acknowledged; commercial component necessary for some form of cost recovery e.g. café/restaurant, childcare or fruit and veggie/charity shop. A purely commercial use of the land is "definitely out of the question"
- Tree canopy cover targets
- The population is growing but new sportsfields are never added
- Parking - some said that existing parking options were enough; some concerns raised by residents
- Floodlighting - lighting required for evening use (to maximise utilisation); time limits for evening use to minimise impact of neighbouring residents
- Accessible by public transport - proximity to train and bus
- Existing nearby public toilet facility
- Usage should complement the Coal Loader Centre for Sustainability
- Opportunity to link/integrate site the (proposed) Sydney Harbour High Line (i.e. provides another attraction along the route)

- Lack/limited capacity other community centre/hall facilities in immediate area - only option is Uniting Church Hall on Bay Road
- Dougherty Centre, Chatswood good example
- Current waste disposal system on site is in poor condition and frequently creates spillages into the park area
- Sensitive revegetation plan required for linking the site to the existing parklands
- Use catering to dog walkers

Next Steps

Commencing in August 2019, Council will seek the wider community's feedback during Stage 2, involving prioritisation of the various use options.

Note: Stage 2 sees some of the suggested uses available for the community to rank/prioritise. Some suggestions from Stage 1 have been discounted due to community facilities already available nearby:

- Coal Loader Centre for Sustainability - community gardens, performance spaces, artist spaces, workshops, function spaces
- Waverton Park - Merrett Playground, outdoor gym equipment and toilet/nappy change facilities

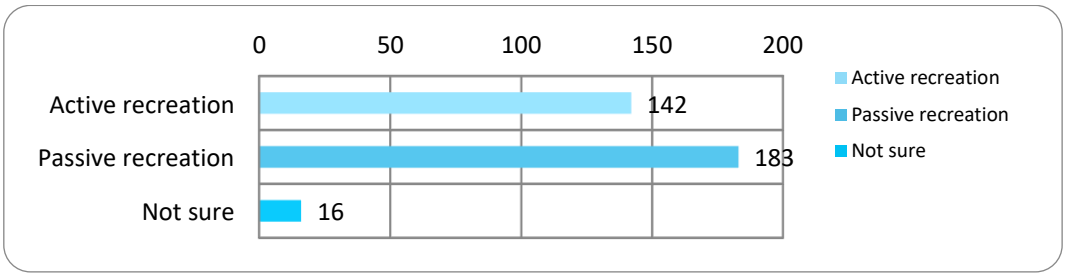
For more information visit Council's website or https://yoursay.northsydney.nsw.gov.au/EWBS

Stage 2 Online Survey Results Summary

The online survey ran from 19 August to 15 September 2019. There were 342 responses. Below are the survey results as exported from Engagement HQ.

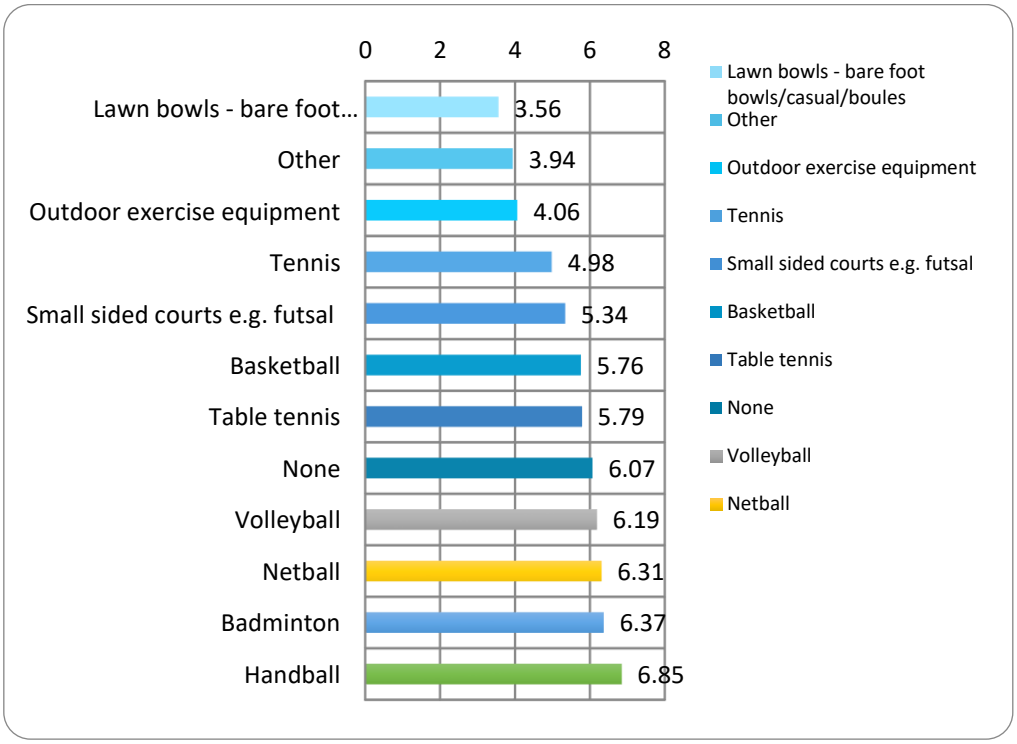
1. What is your preferred use of the site? (choose 1 only)

Majority preference was for passive recreation (54%), followed by active recreation (42%).



2. If the site is used for ACTIVE RECREATION, rank your preferred use: (rank 1 to 10 or none/other, 1 = most preferred, 10 = least preferred)

312 respondents completed this question. The lower the ranking, the more preferred that option is. Majority preference was for lawn bowls including bare foot bowls/casual bowls and boules (average ranking 3.56), followed by other (average ranking 3.94) and outdoor exercise equipment (average ranking 4.06).

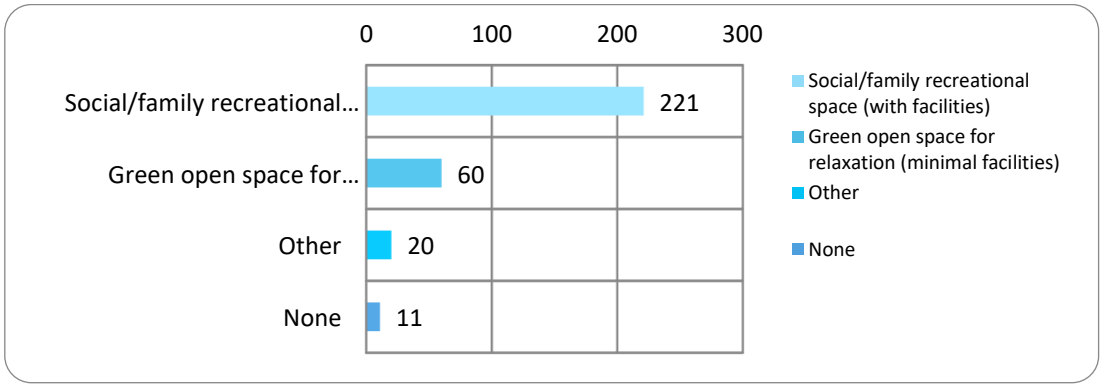


The following table details the 'other' responses. Note: some responses contained more than one suggestion - multiple suggestions counted individually.

Suggestion	No.
Aboriginal cultural/heritage centre	1
Basketball court/hoops (3x3)	4
Childcare	1
Circus skills	1
Community garden (pocket city farm)	6
Community piano	1
Cricket nets/facilities	9
Cricket nets/facilities - indoor	9
Dog park (enclosed/off leash)	3
Facilities (public amenities - toilets, seating, picnic tables)	3
Food and beverage (café or club)	12
Football field (full size/AFL)	2
Footgolf	1
Health and wellbeing programs (with gym)	4
Kids bike track	3
Lacrosse	1
Lawn bowls (includes bare foot bowls/casual bowls and boules	3
Men's Shed	1
Mountain bike jumps	1
Multipurpose community centre	5
Parkland extension	1
Pickleball (paddleball)	1
Play space/playground - adventure (with climbing wall)	6
Play space/playground - inclusive/all abilities	3
Shopping centre with cinema	1
Skate park	1
Swimming pool (50m)	1
Other	3

3a. If the site is used for PASSIVE RECREATION, which would you prefer? (choose 1 only)

312 respondents completed this question. Majority preference was for social/family recreational space (71%), followed by green open space for relaxation (19%) and other (6%).

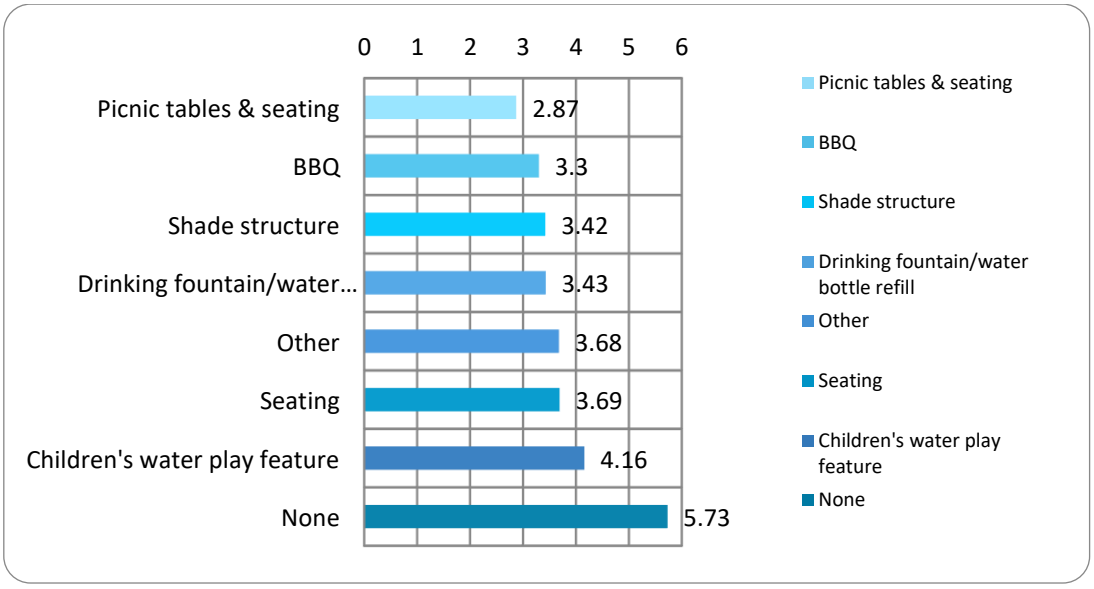


The following table details the 'other' responses. Note: some responses contained more than one suggestion - multiple suggestions counted individually.

Suggestion	No.
Amphitheatre - grass	1
Basketball court/hoops (3x3)	4
Childcare	1
Community garden (pocket city farm)	17
Community piano	1
Cricket nets/facilities	1
Dog park (enclosed/off leash)	6
Facilities (public amenities - toilets, seating, picnic tables, shade, BBQ, water drink station)	14
Food and beverage (café or club, distillery)	28
Health and wellbeing programs (with gym)	5
Hotel	1
Kids bike track	5
Lawn bowls (includes bare foot bowls/casual bowls and boules	4
Men's Shed	2
Multipurpose community centre	15
Parkland extension (landscaping - trees, pathways)	10
Play space/playground - adventure (with climbing wall, flying fox, sunken trampolines, water play)	9
Play space/playground - inclusive (all abilities)	2
Outdoor exercise equipment	2
Skate park/ramp	2
Other	4

3b. If the area were to be used for social/family space (passive recreation), rank your preferred facilities: (rank 1 to 6 or none/other)

Majority preference was for picnic tables and seating (average ranking 2.87), followed by BBQ facilities (average ranking 3.3) and shade structure (average ranking 3.42). The lower the ranking, the more preferred that option is.



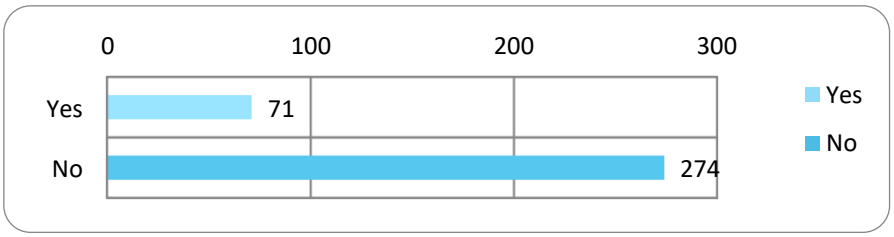
The following table compares the 'other' responses from Q2 and Q3a. The suggestions per question cannot be added together to provide a total, as many respondents provided the same response to both questions (and duplicates Q3b). The purpose of the comparison is to indicate the preferred site features/facilities in addition to preferred site use, whether passive or active.

Suggestion	Q2 No.	Q3a No.
Aboriginal cultural/heritage centre	1	0
Amphitheatre - grass	0	1
Basketball court/hoops (3x3)	4	4
Childcare	1	1
Community garden (pocket city farm)	6	17
Community piano	1	1
Cricket nets/facilities	9	1
Cricket nets/facilities - indoor	9	0
Dog park (enclosed/off leash)	3	6
Facilities (public amenities - toilets, seating, picnic tables, shade, BBQ, water drink station)	3	14
Food and beverage (café or club, distillery)	12	28
Football field (full size/AFL)	2	0
Footgolf	1	0
Health and wellbeing programs (with gym)	4	5
Hotel	0	1
Kids bike track	3	5
Lawn bowls (includes bare foot bowls/casual bowls and boules	3	4
Men's Shed	1	2
Multipurpose community centre	5	15
Parkland extension (landscaping - trees, pathways)	1	10
Pickleball (paddleball)	1	0
Play space/playground - adventure (with climbing wall, flying fox, sunken trampolines, water play)	6	9
Play space/playground - inclusive/all abilities	3	2
Shopping centre with cinema	1	0
Outdoor exercise equipment	0	2
Skate park/ramp	1	2
Swimming pool (50m)	1	0
Other	4	3

Respondent Information

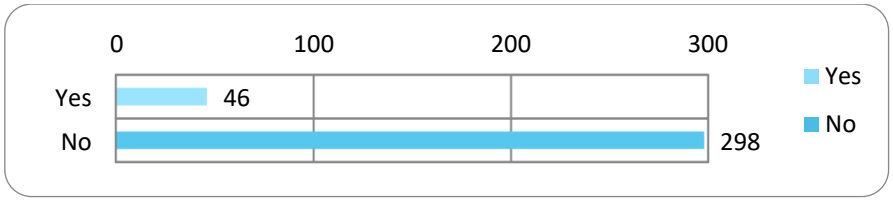
4. Are you associated with a sporting group? (required)

79% of respondents are not associated with a sporting group. 21% are associated with a sporting group.



5. Are you associated with a community group? (required)

87% of respondents are not associated with a community group. 13% are associated with a sporting group.



6. Respondent Suburb

89% of respondents were from the North Sydney LGA (304 of total 342 responses) - Waverton (35%), followed by Wollstonecraft (20%) and North Sydney (11%). 11% (38) of respondents were from outside the North Sydney LGA.