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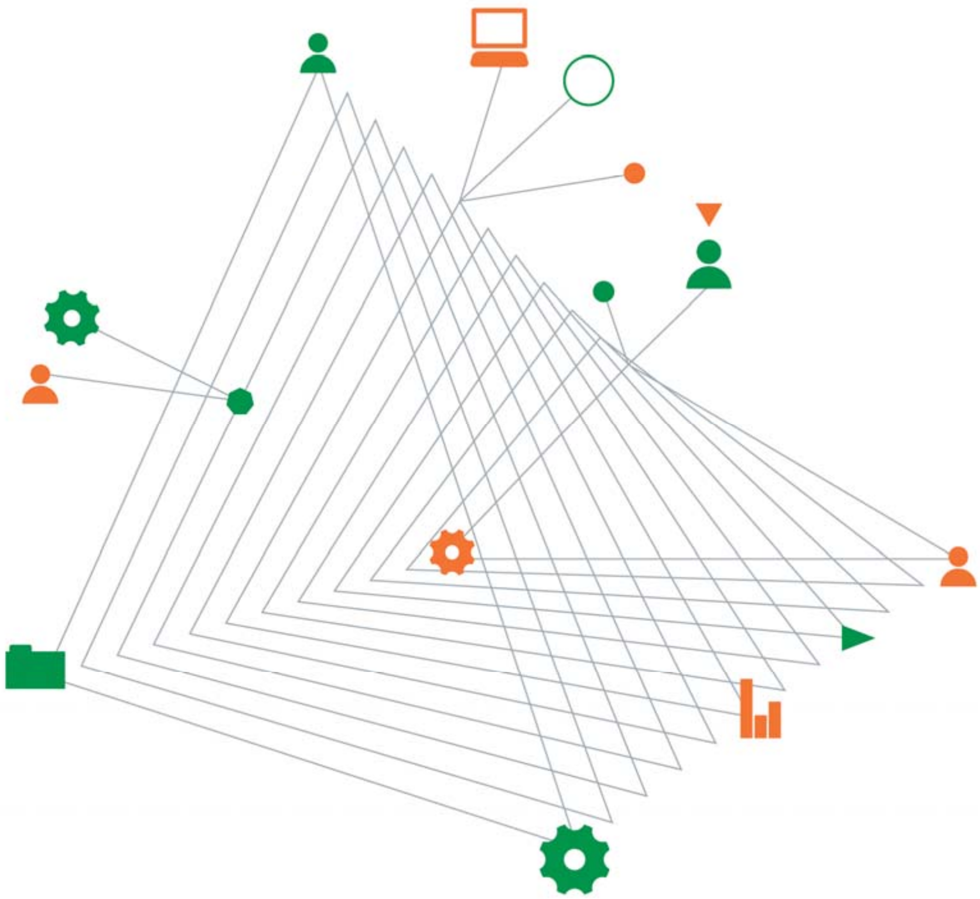
TKD Architects Pty Ltd

Detailed Site Investigation

Alexandria Park Community School, Park road,
Alexandria NSW

26 October 2017



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Detailed Site Investigation

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Quality information

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Abbreviations

μg/L	micrograms per litre
ACM	Asbestos Containing Materials
AEC	Area of Environmental Concern
ANZECC	Australian and New Zealand Environment Conservation Council
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
BCA	Bouygues Construction Australia
bgs	below ground surface
BH	Borehole
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
C6-C36	Hydrocarbon chainlength fraction
COPC	Chemicals of Potential Concern
CSM	Conceptual Site Model
DA	Development Application
DBYD	Dial Before You Dig
DO	Dissolved Oxygen
DP	Deposited Plan
DQO	Data Quality Objectives
DSI	Detailed Site Investigation
EC	Electrical Conductivity
EIL	Ecological investigation level
EPA	Environmental Protection Authority of NSW
EPLs	Environmental Protection Licences
ESL	Ecological screening level
eV	Electron Volt
GIL	Groundwater Investigation Level
GPS	Global Positioning System
HA	Hand auger
Ha	Hectare
HIL	Health Investigation Level
HSL	Health Screening Level
IP	Interface Probe
LOR	Limit of Reporting
mbgs	Metres below ground surface
mbtoc	Metres Below Top of Casing

mg/kg	milligrams per kilogram
mg/L	milligrams per litre
mm	Millimetre
mS/cm	Micro-Sieverts per centimetre
mV	millivolt
NAPL	Non-Aqueous Phase Liquids
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEPM	National Environment Protection (Assessment of Site Contamination) Measure as revised 2013
OC	Organochlorine Pesticides
OEH	Office of Environment & Heritage of NSW
OP	Organophosphate Pesticides
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyls
PID	Photoionisation Detector
Ppm	Parts per million
QA	Quality Assurance
QC	Quality Control
RAP	Remedial Action Plan
RPD	Relative Percent Difference
SHE	Standard Hydrogen Electrode
SOP	Standard Operating Procedure
SVOC	Semi Volatile Organic Compounds
TCLP	Toxicity Characteristic Leaching Procedure
TPH	Total Petroleum Hydrocarbons
VENM	Virgin Excavated Natural Material
VOC	Volatile Organic Compounds

1. Introduction

1.1 General

Coffey Services Australia Pty Ltd (Coffey) was engaged by TKD Architects Pty Ltd (TKD) to carry out a contamination assessment and prepare a Detailed Site Investigation (DSI) report to support a Development Application (DA) for the proposed redevelopment of Alexandria Park Community School located on Park Road, Alexandria NSW (herein referred to as the 'site'). The location of the site is shown in Figure 1.

The southern half of the site currently comprises the existing school grounds, and the northern half of the site comprises a rectangular grassed field on which the temporary 'pop up' school is currently being constructed.

The work was commissioned by Anna Harris of TKD. The works were undertaken in accordance with our fee proposal dated 2nd December 2017 (ref: SYDEN199382-P01).

1.2 Proposed Development

The proposed development shall comprise the construction of new school facilities. The design of the proposed school is currently in concept phase, and a selection of drawings that describe the various layout options for the proposed development are provided in Appendix A. Based on the three concept designs, the proposed development will include:

- Demolishment of all permanent and temporary school buildings currently on site.
- Construction of new school buildings and facilities within site.
- Construction of play areas.
- Landscaping within the site.

TKD has indicated that the proposed development will not include a basement.

1.3 Objectives

In general, the DSI has been prepared to characterise ground conditions at the site and assess the suitability of the site for the proposed use in accordance with the requirements set out under State Environmental Planning Policy No. 55 *Remediation of Land* and its associated planning guidelines presented within *Managing Land Contamination: Planning Guidelines* (DUAP/EPA; 1998).

The specific objectives of the DSI were to:

- Assess the potential for contamination of the site resulting from current and historical land uses;
- Investigate potential surface and subsurface contamination at the site in the context of assessing the suitability of the site for the proposed development; and
- Assess whether further management and/or remediation works may be required to make the site suitable for future land uses.

1.4 Scope of Work

To meet the above objectives, Coffey undertook the following works:

- Desktop review of readily available information to identify historical land uses and the environmental context of the site;
- Undertake a site walkover survey to observe potential contamination sources onsite and within surrounding land;
- Undertake intrusive ground investigation works to assess the significance potential contamination suspected within potential sources of contamination identified during the desk study and site walkover; and
- Preparation of this DSI report in general accordance with relevant sections of NSW EPA 'Guidelines for Consultants Reporting on Contaminated Sites' NSW OEH (2011) and Schedule B2 of the ASC NEPM (NEPC, 2013).

1.5 Applicable Regulations & Guidelines

This assessment has been prepared having regard to the following regulations and guidance documentation:

- State Environmental Planning Policy No 55 - Remediation of Land
- DUAP/EPA (1998); Managing Land Contamination: Planning Guidelines
- NEPC (2013) National Environment Protection (Assessment of Site Contamination) Amendment Measure (NEPM) (No. 1) as registered and amended in 2013, and associated Schedule B guidelines (the 'ASC NEPM').
- DEC (2006); Guidelines for the NSW Site Auditor Scheme, 2nd edition
- NSW EPA (1995); Guidelines for Consultants Reporting on Contaminated Sites
- DEC (2007); Guidelines for the Assessment and Management of Groundwater Contamination
- DECC (2009); Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality, published by ANZECC and Agriculture and Resource Management Council of Australia and New Zealand, Paper No 4 (October 2000)

2. Site Location & Description

2.1 Site Location

The site is located on Park Road, Alexandria NSW, as shown in Figure 1. The site is within the City of Sydney Local Government Area and is identified as the following land title:

- Lot 11 in DP615964;
- Lots 1 & 2 in DP74696;
- Lot 3 in DP69494;
- Lots A & B in DP109038.

2.2 Site Description

The site comprises an approximately rectangular parcel of land covering an area of approximately 2.7ha. Figure 2 shows the current layout of the school and boundaries of the site. A site walkover was undertaken by Alex Ructtinger (18th January 2017) and Junaid Riaz (23rd & 24th January 2017), experienced Coffey environmental scientists. The key site features observed during the site walkovers are noted in Figure 2, and summarised below. Site photographs are presented in Appendix G.

- The southern half of the site currently comprises the existing school grounds and buildings of Alexandria Park Community School. The southern half of the site comprised the school grounds, and consisted of:
  - Staff carpark
  - School facilities and buildings/class rooms (Block A to Block C)
  - Basketball play area
  - Equipment play areas
  - Grassed play area
  - Vegetable gardens
  - Equipment storage sheds
- At the time of the walkover, the northern half of the site comprised a rectangular grassed field on which the temporary 'pop up' school was being constructed. The pop up school comprises a number of demountable buildings constructed on raised pier foundation. The northern half of the site was surfaced predominantly with grassed.
- The site was noted as being generally flat.Available topographic survey data indicates that the site is situated at approximately 13mAHD, with a gentle slope down towards the south/southwest.
- Anecdotal evidence from the manager coordinating the pop-up school construction works indicated that bonded asbestos cement fragments had been encountered within the northern half of the site during service excavations. During the site walkover, a fragment of bonded asbestos cement was also noted on grassed playground adjoining the Park Street entrance. The fragment was triangular shaped and approximately 4cm in length. The fragment edges were sub-angular and it did not crumble with moderate hand pressure. Figure 3 illustrates the locations where bonded asbestos has been identified.
- During the walkover, the Coffey environmental scientist did not observe visible signs of chemical contamination such as soil staining, odorous soils, bare soil patches, and visible signs of plant stress. The uncontrolled storage of waste materials was not observed within the site. No evidence of bulk storage tanks was noted.

2.3 Surrounding Land Uses

The site is situated in an area characterised by various commercial and retail land uses which are summarised in Table 2.1.

Table 2.1: Surrounding Land Uses

Direction	Land Uses
North	• Buckland Street, residential and commercial properties beyond
East	• Park Road, Alexandria Park and a business/commercial park (to the south east)

South	• Commercial retail properties and high density residential dwellings
West	• Commercial retail properties, and high density residential dwellings

3. Geology, Hydrogeology& Hydrology

3.1 Geology

A review of the Sydney 1:100,000 Geological Sheet (Sheet No. 9130; dated 1983) produced by the NSW Geological Survey indicates the site is underlain by Quaternary aged medium to fine-grained marine sand with podsols (Botany Sands). The sands are expected to be underlain by Hawkesbury sandstone at depth. Intrusive invesitgations conducted by Coffey (2017) indicate fill material is present within the site, overlying the Botany Sands.

3.2 Hydrology

No water bodies are located within the site, however the historic Sheas Creek swamp area was previously located on the southern section of the site. This area was progressively reclaimed between 1887 and circa 1900 based on historical parish maps (refer Section 4.2).

Alexandria Canal is the nearest surface water body to the site, which flows within a concrete lined channel, approximately 950m southwest of the site. Alexandria Canal discharges into the Cooks River.

3.3 Hydrogeology

Groundwater is expected to occur within the natural Botany Sands. The topography of the site slopes very gradually to the south/south west. The former Sheas' Creek swamp land was located on the southern portion of the site before it was reclaimed as part of the development of the area. Sheas Creek currently exists today as a concrete lined drain which discharges into the concrete lined Alexandria Canal. Considering this and the presence of Alexandria Canal to the southwest, it is anticipated that groundwater would flow in a south/south-westerly direction.

Subsequent groundwater monitoring conducted as part of this study reported standing groundwater levels ranged between 9.533mAHD (MW1) and 10.683mAHD (MW3) (3.337 mbTOC to 2.427 mbTOC) indicating groundwater flows in a south-westerly direction.

A search of groundwater bores registered with the NSW Office of Water is included within the Lotsearch Report (Appendix B). Numerous registered groundwater bores are located within 500m of the site. All are for monitoring purposes with the exception of GW106192, which is listed for domestic purposes. The use of the well is considered unlikely for potable purposes as the groundwater well is located within Zone 2 of the Botany Groundwater Management Zone, which restricts the abstraction of groundwater for domestic purposes. The well is located 248m north-east and up hydraulic gradient from the site.

3.4 Acid Sulfate Soils

With reference to the Acid Sulfate Soil Risk Map for Botany Bay (Map No 9130S3), published by the Dept Land & Water Conservation, and records presented in the Australian Soil Resource Information System (www.asris.csiro.au), the site is identified as having low risk of acid sulfate soil materials being present. Coffey note that an area of Disturbed Terrain encroaches the southern boundary of the site, which is likely to relate to historic land reclaimation activities to develop the historic Sheas Creek swamp area. As acid sulfate soils are formed when naturally occurring sediments are deposited in low lying estuarine conditions, it is considered feasible that potential acid sulfate soils may exist within the site beneath fill used to reclaim the surrounding area.

It is noted that the southern portion of the site is classed as Class 3 under the City of Sydney Local Environment Plan (LEP), which indicates acid sulfate soils may be encountered where works are conducted more than 1 meter below the natural ground surface. Similarly, development controls are required for works that lower the water table by more than 1 meter below the natural ground surface.

An acid sulfate soils assessment was conducted by Environmental Investigation Services (EIS) Ref: E30907Klet-ASS, which identified the presence of Potential Acid Sulfate Soils (PASS) below RL5mAHD. No PASS or Actual Acid Sulfate Soils (AASS) was identified in the soil samples collected from the site above RL5mAHD.

4. Site History Review

4.1 Aerial Photography

A summary of the findings of the aerial photograph review is presented in Table 4.1. Aerial photographs are provided in Appendix B.

Table 4.1: Aerial Photograph Summary

Date	Comments
1930	The site is occupied by factories/warehouses of varying sizes. The north western section of the site appears to be used as a storage yard. Although the photograph is of low resolution, it appears that some buildings are currently being constructed and/or renovated, in particular the south eastern and northern section of the site. The site appears to be situated in an industrial area of Alexandria. The site is surrounded by warehouses/factories, and Alexandria Park is located to the east of the site. To the north of the site is a mix of residential and commercial buildings.
1943	The construction/renovations of the warehouses on site has been completed. The site consists of the following: • Storage yard in the north western corner. • Several (5-6) elongated warehouses occupy the northern part of the site. The warehouse structures range in size from small (10m x 5m) to medium (60m x 10m) • The southern half of the site comprises 5-6 warehouses of varying sizes. A large warehouse situated on the south eastern corner measures approximately 50m x 120m. The other warehouses are small to medium sized. • The south western corner of the site contains no structures and the surface is covered in concrete. The industrial buildings to the south of the site, beyond McEvoy Street have been redeveloped. Some minor renovations have occurred to the commercial buildings to the west of the site.
1955	Some roof restoration/renovation has occurred on the large warehouse in the south eastern corner of the site. Two medium sized elongated warehouses have been constructed in the north western section of the site. No other significant changes have occurred on site. Historic map extracts

Date	Comments
	provided in Appendix B show that Murray Brothers Pty Ltd (timber/furniture manufacture business) occupied warehouses and yards within the northern portion of the site at this time. The southern portion of the site was occipued by the Federal Match Company Pty Ltd (match manufacturing). Minor renovations have occurred to some properties to the west of the site. No other significant changes have occurred in the surrounding area.
1961	No significant changes to existing land uses of the site or surrounding area are noted.
1965	No significant changes to existing land uses of the site or surrounding area are noted.
1970	No significant changes to existing land uses of the site or surrounding area are noted.
1982	All of the industrial warehouses/buildings on site have been demolished. The southern half of the site has been developed, with structures consistent with the current layout of Alexandria Park Community School. The school consists of school buildings/facilities to the south, and playground areas, staff carpark and grassed areas to the north. The northern half of the site is vacant, and it appears some earthworks are occurring in this area, possibly spreading of topsoil. No significant changes to the surrounding area are noted, however various warehouses to the south-west of the site, beyond Fountain Street have been demolished. Basketball courts have been constructed in Alexandria Park.
1991	The northern half of the site has been grassed over, and appears to be used as a playing field. The commercial buildings immediately south east of the site have been demolished, and new buildings have been constructed. The configuration of the buildings resemble a commercial business park. Redevelopment of buildings to the south (beyond McEvoy Street) and to the south west (beyond fountain street) has also occurred.
2000	No significant change to uses of the site is noted. Some residential apartments have been constructed to the west of the site, adjacent Fountain Street. No other significant changes have occurred in the surrounding area.
2007	A bus bay has been constructed to the east of the site, adjacent Park Road. Some renovations have occurred to the staff carpark and playground areas in the centre of the site. No significant changes to existing land uses of surrounding area are noted.
2016 (Google Earth)	No significant change to uses of the site or the land surrounding the site is noted.

4.2 Historic Parish Maps

A review of historical parish maps was undertaken to characterise land uses that pre-dated available aerial photographs of the Alexandria area. The Sands Directory Map of the City of Sydney and Suburbs (1887) show that the southern portion of the site is part of the Sheas Creek swamp. Park Road, Belmont Street and Fountain Street have not yet been constructed, and the land appears undeveloped land at this time.

By 1893, roads including Buckland Street, Mitchel Road and Fountain Street had been established. The map extract shows the northern portion of the site and immediate surrounds to have been developed predominantly with terraced housing, with a number of 'sheds' and 'sewer shafts' are noted.

4.3 Historical Business Directory Records

A review of historical business directory records from 1950, 1970 and 1991 (appendix B) reveal that a timber/furniture manufacture business (Murray Brothers Pty Ltd) operated in the northern part of the site, and match manufactures (Federal Match Co Ltd) in the southern part of the site from at least 1950 until decommissioning circa 1975.

A web search indicates the Federal Match Company was established in Alexandria in c.1910.

Other business of interest which were operating adjacent to the site include:

- Fuel merchants
- Motor services / petrol station
- Polish/paint manufactures
- Engineer manufactures
- Chemical manufacturers
- Paint and soap manufactures
- Electrical motors manufactures
- Pipe / pipe fitting / PVC manufactures
- Refrigeration manufactures
- Cleaning product manufacturers

Figure 5 shows the locations of various historical business located on or in the vicinity to the site.

4.4 Available Heritage Assessment

Hibbs and Associates (2016) document extracts from the following heritage assessment prepared for the northern portion of the site:

- Kass, T. (July 2016); *A History of the Site Alexandria Park Community School – Park Road – Junior Campus and Oval*

In summary, the above report outlines the following additiona information regarding the historical uses of the site:

- Murray Brothers acquired the northern portion of the site in c.1930 to manufacture furniture, window frames, doors and sashes. By 1960, Muray Brothers had moved the majority of its operations to Villawood, but maintained ownership of the property, and leased it to various occupants; namely:
  - Remington Rand Charters Pty Ltd leased the ground floor of the Murray Brothers building from 1961 for 10 years to ‘produce business machines and typewriters’.
  - ‘Kornblums Pty Ltd ‘leased a section of the site from 1962 for 10years’. Kornblums reportedly manufacture blinds and curtains.
  - Mitsubushi (Australia) Pty Ltd leased a section of the site in 1963. The nature of Mitsubusi’s operations on site are unknown.

A complete copy of the heritage assessment prepared by Kass, was not available to Coffey to conduct a review as part of this assessment.

4.5 NSW EPA Records

4.5.1 Contaminated land register

A search of the NSW EPA online contaminated land register was included within the Lotsearch report (Appendix B).

The register is a searchable database of:

- Orders made under Part 3 of the Contaminated Land Management Act 1997 (CLM Act);
- Approved voluntary management proposals under the CLM Act that have not been fully carried out and where the approval of the Environment Protection Authority (EPA) has not been revoked;
- Site audit statements provided to the EPA under section 53B of the CLM Act that relate to significantly contaminated land;
- Where practicable, copies of anything formerly required to be part of the public record
- Actions taken by EPA under section 35 or 36 of the Environmentally Hazardous Chemicals Act 1985 (EHC Act);

The register indicated that there are currently no records relating to any of the above matters issued for the site, or the properties immediately adjoining the site.

The register indicated there were four properties within 500m of the site which were recorded within the database. The four sites include:

- Australian Technology Park (258m north of the site);
- Caltex Alexandria Service Station (262m east of the site);
- Alexandria Gardens (289m north east of the site); and
- John Street, Waterloo (406m east of the site).

Due to the geographical distance from the site, it is considered unlikely that the above properties would result in groundwater contamination to the site.

4.5.2 Environment Protection Licences

A search of the NSW Protection of the Environment Operations Act 1997 (POEO Act) public register, administered by the EPA, was conducted, with the findings summarised in Appendix B. The POEO Act public register indicates that no environment protection licences (EPLs) for activities under the POEO Act are currently being carried out at the site.

The register however, identified the following EPLs within 500m of the site:

- Current EPL 12208 for Sydney Trains, located directly east of the site within the railway corridor. The EPL relates to railway systems activities.
- Former EPL 1107 for Metromix Pty Ltd, located 228m east of the site. The EPL relates to concrete works.
- Former EPL 3428 for Concrite Pty Ltd, located 308m south-east of the site. The EPL relates to concrete works.
- Former EPL 12389: Rail Corporation NSW, located 454m north of the site. The license relates to storage and generation of hazardous, industrial or Group A waste.

- Former EPL 6086: Australian Metal Co Pty Ltd, located 490m south east of the site. The license relates to storage and generation of hazardous, industrial or Group A waste.

Due to the geographical distance from the site, it is considered unlikely that he above properties would result in groundwater contamination to the site.

4.6 Botany Groundwater Management Zones

A number of contaminated sites have resulted in the contamination of groundwater in the Botany Sands Bed Aquifer. A review of the Botany Groundwater Management Zones maps online (http://www.botanybay.nsw.gov.au/Environment/Water-Energy/Groundwater) indicated the site is located within Zone 2 of the Botany Groundwater Management Zone, which restricts the abstraction of groundwater for domestic purposes.

4.7 SafeWork NSW Dangerous Goods Search

A search of the SafeWork NSW information on storage of hazardous chemicals for the site was undertaken on 24 January 2017. The search of the records held by SafeWork NSW did not locate any records pertaining to the site (refer to Appendix H).

4.8 Summary of Site History

In summary, the earliest available records (1887) indicate the site and surrounds formed part of the Sheas' Creek swamp and appeared undeveloped. By 1893, the site and surrounds had been developed for predominantly residential uses, with part of the road network also established by this time.

The period between 1893 and the first available aerial photograph (1930), the site had subsequently been developed for commercial/industrial uses with a number of warehouses noted on the site. At this time, Park Road, Fountain Street and Belmont Street had been constructed, and land surrounding the site had been developed for a mixture of commercial/industrial and residential uses. Alexandria Park had also been developed in land adjacent to Park Road.

Records indicate that the northern portion of the site was occupied by Murray Brothers Pty Ltd, a furniture manufacturing business. Murray Brothers subsequently leased this part of the site to various parties involved in the manufacture of business machines, typewriters, cutains and blinds.

The southern portion of the site was owned by Federal Match Co Ltd, a match manufacturing business between 1910 and c.1975. Historical business records between 1950 and 1991 indicate various industrial activities were also operating in the areas immediately adjacent the site.

Industrial land uses were present on site until circa 1975, where aerial photography indicate the buildings on the site were all demolished. The 1982 aerial photography shows the construction of Alexandria Park Community School has been completed on the southern half of the site, with the northern part of the site remaining an open grassed field until present day. The southern part of the site has continued to be used as a school up until present day, however minor renovations of the school ground (and construction of a bus bay) was evident from aerial photography between 2000 and 2007. Industrial land uses surrounding the site gradually changed to commercial retail/high density residential from circa 1980.

4.9 Integrity Assessment of Historical Data

The following sources of historical data were referred to for this assessment:

- Selected aerial photographs for the period between 1930 and 2016;

- Lotsearch Report (2017);
- Historic parish map from the Sands Directory (City of Sydney) extracts for 1887 and 1893;
- Extract from a heritage assessment prepared by Kass (2016) for the northern portion of the site.
- NSW EPA register for listings of contaminated sites and licensed activities;
- SafeWork NSW records on storage of hazardous chemicals
- Observations made during the site walkover; and
- Anecdotal evidence from the pop-up school construction manager.

A review of readily available records was undertaken to develop an understanding of the historical uses of the site. The observations made during the site walkover were generally consistent with the recent aerial photographs and records provided by third parties.

A search of SafeWork NSW database of licenses to store dangerous goods (i.e.fuels and various scheduled chemicals) at the site did not return any records for the site. Available historic records indicates that the site, and surrounding land have been subject to various industrial activities since the late 19th century, which are likely to pre-date the requirements to license the storage of dangerous goods. As such, the storage of dangerous goods on site can not be ruled out.

The time spacing between aerial photography and historical business records used in this assessment is considered adequate to develop an appreciation of the sequence of site development. As the site was already substantially developed in 1930, the period when the earliest aerial photographs was produced, historic parish maps were reviewed to obtain an understanding of early uses of the site. Whilst these maps and early photographs provide an appreciation of the nature of land uses conducted on site, limited information exists relating to the layout of industrial operations conducted on site (e.g. raw material and chemical storage areas, workshops, drainage plans etc.).

Coffey considers the historical data assessed was adequate to develop an appreciation of different land uses and potential activities conducted within the site historically, although we note that some uncertainty remains regarding the exact nature and location of industrial operations conducted within the site. This uncertainty has been considered further in developing the scope of investigations completed as part of this assessment.

5. Previous Investigations

5.1 General

Coffey were provided with the following reports for review as part of this assessment:

- Hibbs & Associates (2016); Phase 1 and Limited Soil Sampling Investigation, Waterloo High School (Ref: S9179; dated July 2016).
- GeoEnviro Consultancy Pty Ltd (2016); Geotechnical Investigation, Proposed Temporary School Buildings, Alexandria Park High School, Park Street, Alexandria NSW (REF: JG16980A-r1; dated September 2016).

A summary of the relevant information from these investigations are provided below.

5.2 Phase 1 and Limited Soil Sampling Investigation, Waterloo High School (Hibbs & Associates, 2016)

The report prepared by Hibbs & Associates presents Phase 1 and limited soil sampling investigation for the sports field located at 7-11 Alexandria Park Road, Alexandria, which comprises the northern part of the current site. This assessment was prepared prior to the construction of the temporary pop-up school, when the location was a vacant grassed field.

The investigation found that there was potential for contamination to be present on site due to the known former industrial activities undertaken on site (furniture manufacturing, office machine development, mechanical industries). The key findings from these investigations are summarised below:

- Drilling of 5 hand augers to depths between 0.9m and 1.6mbgs.
- Collection of soil samples from fill and residual soils for chemical analysis for chemicals of potential concern (COPC) identified by Hibbs & Associates, including heavy metals (As, Cd, Cr, Cu, Pb, Ni, Hg and Zn), total recoverable hydrocarbons (TRH) and, monoaromatic hydrocarbons (BTEX).
- Ground conditions encountered were described as approximately 200mm of dark brown silty clay topsoil, overlying grey to red to brown silty sand and clay fill to the maximum depth of investigation (1.6m bgs). Natural material was not encountered within the sampling locations.
- No odorous or visibly stained/discoloured soils were noted by Hibbs & Associates during the investigation. No visible signs of ACM were noted during the investigations. PID headspace readings recorded concentrations between non detect (presumed to be <0.1ppm) and 0.4ppm, indicating a low likelihood for ionisable VOCs to be present in soil samples collected.
- A total of 5 soil samples were submitted for chemical analysis. In summary, the analysis reported concentrations of organic COPC were reported below the adopted health investigation and screening levels for a generic low density residential land use (i.e. HIL A as presented within Schedule B1 of the ASC NEPM (NEPC, 2013).
- In conclusion, Hibbs & Associates ‘has not encountered any soil conditions that would preclude the continued use of the site’ as a school. Hibbs & Associates recommended that ‘appropriate controls should be implemented during site development to manage the potential risk associated with the presence of asbestos beneath the site. This should include the development and implementation of an unexpected finds protocol.

5.3 Geotechnical Investigation, Proposed Temporary School Buildings, Alexandria Park High School, Park Street, Alexandria NSW (GeoEnviro Consultancy Pty Ltd, 2016)

The report presents a geotechnical investigation for the site to provide information to inform the construction process for the proposed redevelopment of the site. The instigation comprised of a total of twelve boreholes (BH1 to BH12, HA1 & HA2) throughout the site[1]. No environmental sampling was conducted as part of the investigation.

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[1] The report indicates the bores were drilled with ‘spiral augers’, yet bore logs presented in Appendix A indicate each bore was drilled using a V-Bit or wash boring techniques.

The investigation revealed the following:

- Ground conditions generally comprised of fill (gravelly clayey sand, gravelly silty sand and silty sand) to various depths ranging from 0.4m to 3.4m below the ground surface. Anthropogenic material including bricks, concrete, wire and sandstone was encountered within the fill.
- Natural material was encountered throughout the site generally comprising fine to medium grained grey and brown sand.
- Bedrock was not encountered in any of the boreholes which were terminated at a maximum depth of 8.5m below the ground surface.
- Groundwater was intersected in locations (BH1 to BH10) at depths varying 2.4m to 3.7m below the ground surface.

6. Preliminary Conceptual Site Model

6.1. Potential areas and chemicals of potential concern

Table 6.1 shows the Areas of Environmental Concern (AEC) and associated Chemicals of Potential Concern (COPC) identified.

Table 6.1 – Potential areas and chemicals of potential concern

AEC	Potentially Contaminating Activity	Potential COPC
1 (Entire Site)	Fill materials of unknown quality present across the entire site arising from early land reclamation and recent demolition of former building structures.	• Heavy metals (As, Cd, Cr, Cu, Ni, Hg, Pb, Zn) • Hydrocarbon compound including TRH, BTEX, PAH. • Pesticides (OCP) • Asbestos
2 (Northern Site)	Furniture manufacture associated with the former Murray Brothers warehouse located within the northern part of the site (present day pop up school and playing field).	• Heavy metals (Cd, Cr, Pb, Zn) • Solvents, polishes, paints, stains, waxes (VOC, SVOC, TRH, BTEX, PAH). • Various acids and alkalis
3 (Southern Site)	Match manufacturing associated with the Federal Match Company, which occupied the southern portion of the site (current day Alexandria Park School)	• Heavy metals (Pb, Sb, Mg) • Hydrocarbon compounds for match fuel and binders including TRH and PAH. • Inorganic indicator compounds including Potassium perchlorate, picric acid (trinitrophenol).
4 (Off Site)	Off site sources including fuel merchants, vehicle maintenance, polish/paint/soap manufactuers, chemical manufacturers electrical motors manufactures, pipe/PVC manufactures, cleaning product manufacturers. Refer to Figure 5.	• Fuel hydrocarbon compound including TRH, BTEX, PAH. • Volatile organic compounds (broad screen of VOC and SVOC) • Chlorinated and other halogenated hydrocarbons (VHC) • Heavy metals (As, Cd, Cr, Cu, Ni, Hg, Pb, Sb, Mg, Zn)

6.2. Potential areas and chemicals of potential concern

Based on the findings of the desk study, and previous investigations, Table 6.2 presents a preliminary conceptual site model.

Table 6.2: Preliminary Conceptual Site Model

AEC	Potential Areas of Concern	Exposure Pathways	Receptor	Discussion
AEC 1	Fill Materials of unknown quality present across the entire site	Inhalation Ingestion Dermal Contact	Current/Future Site Users (school children and teaching staff) Construction Worker Maintenance Worker	Records indicate that the site was predominantly used for industrial purposes following a period of reclamation. Records also indicate that all industrial buildings/structures on site were demolished prior to the construction of Alexandria Park Community School. Poor historic demolition practices may have hazardous residues within fill. Fill material has the potential to pose risks to: • Current/future users of the school and workers via inhalation, ingestion and dermal contact payways. • Groundwater underlying the site via infiltration. • Alexandria Canal via infiltration via lateral migration of groundwater through the Botany Sands Aquifer.
		Infiltration Lateral groundwater migration	Groundwater Alexandria Canal	
AEC 2 & 3	Known historic industrial uses, including furniture manufacture (north) and match manufacture (south)	Inhalation Ingestion Dermal Contact	Current/Future Site Users (school children and teaching staff) Construction Worker Maintenance Worker	Former industrial uses may have resulted in contamination to soil and groundwater which may pose risks to: • Current/future users of the school via inhalation, ingestion and dermal contact payways. • Groundwater underlying the site via infiltration. • Alexandria Canal via infiltration via lateral migration of groundwater through the Botany Sands Aquifer.
		Infiltration Lateral groundwater migration	Groundwater Alexandria Canal	
AEC 4	Off site sources	Inhalation	Current/Future Site Users (school children and teaching staff)	Historic industrial land uses adjacent to the site may have resulted in the deterioration of groundwater quality beneath the site, which

		Dermal contact Ingestion Inhalation	Construction Worker Maintenance Worker	may pose risks to: • Lateral migration of groundwater on to site • Current/future users of the school via inhalation of groundwater vapours. • Workers conducting subsurface works via dermal contact, accidential ingestion and inhalation.

6.3 Data Gaps and Uncertainties

Based on a review of available data, data gaps and uncertainties are considered to include the following:

- Insufficient data to charactere the fill material across the site;
- Insufficient chemical data on potential contaminants of potential concern (COPC) associated with known industrial activities conducted within the site, and surrounds;
- The variability of the COPC within the fill material;
- Waste classification of the surplus fill materials excavated as part of the proposed development; and
- Insufficient data to assess groundwater quality beneath the site.

6.4 Assessment of data quality objectives

As stated in Section 5 of Schedule B2 – Guideline on Site Characterisation in the ASC NEPM, the data quality objectives (DQO) process is used to define the type, quantity and quality of data needed to support decisions relating to the environmental condition of a site.

The seven-step DQO process adopted for this assessment is provided below:

Step 1: State the Problem

The primary objectives of this assessment are to assess:

- Investigate potential surface and subsurface contamination in relation to the AECs identified by previous investigations, the historical desktop review and walkover of the site;
- Interpret investigation findings and provide an opinion on the suitability of the site for the proposed redevelopment; and
- Assess what remediation and/or management works may be required to make the site suitable for proposed future land use (if any).

Based on this, the main problems are:

- How many sampling locations should be conducted, and where?
- What are the COPC?
- Could access restrictions limit available sampling locations, and the method(s) used for investigation?

- To what depths should sampling locations be conducted?
- At what depth should soil samples be collected?

Step 2: Identify the Decision

Is the site suitable for the proposed redevelopment, and if not, then what is the type and extent of contamination that requires remediation or management?

Step 3: Identify Inputs to the Decision

The primary inputs to assessing the above include:

- Information gathered as part of the previous investigations, the historical desktop review and walkover of the site.
- Observations and soil headspace screening measurements made by Coffey during field investigations.
- Results of investigations undertaken on the site.
- Relevant legislation and regulatory guidelines.
- Likely future land use as indicated by the concept design for redevelopment.

Step 4: Define the Study Boundaries

The study boundaries are defined by the boundaries of the site as shown in Figure 2.

The vertical boundary is defined as two metres below the standing water table. Where indicators of potential contamination are observed locally, the vertical boundry will be increased.

Step 5: Develop Decision Rules

Has fieldwork been carried out in accordance with current industry good practice, Coffey Standard Operating Procedures (SOPs) and relevant guidelines?

- *If Yes*; then this is an indicator that the generated data is satisfactory for the purpose of the assessment.
- *If No*; then data may not be satisfactory for the purpose of the assessment. In this case:
  - Assess the potential impact of the non-conformance on data quality, and reject data that may not be reliable.

Does QA/QC sample data meet specified Data Quality Indicators (DQI)?

- *If Yes*; then this is an indicator that the generated data is satisfactory for the purpose of the assessment.
- *If No*; then data may not be satisfactory for the purpose of the assessment. In this case:
  - Consider influence of heterogeneous nature of the sample and/or reported contaminant concentrations (i.e. close to the laboratory limit of reporting (LOR)) and, based on this, assess the suitability of the results for inclusion in the data set.
  - Consider influence of non-compliance with fieldwork procedures and, based on this, assess the suitability of the results for inclusion in the validation data set.
  - If an anomaly is considered to be a result of laboratory error, request re-analysis of the sample in question by the project laboratory or a secondary laboratory.

Where data is considered satisfactory for the purpose of the assessment, do the contaminant concentrations reflect observations made in the field regarding contamination (i.e. PID, odour, lithology, etc.)?

- *If Yes*; then data shall be considered representative.
- *If No*; then further assessment may be necessary to confirm and reconcile the data with the observations.

Where data is considered satisfactory for the purpose of the assessment, do the contaminant concentrations exceed the proposed assessment criteria? The statistical parameters of interest are the concentrations of the COPC identified in Table 6.1. The action levels are the Assessment Criteria provided in Section 8.

The decision statements are:

- The 95% Upper Confidence Limits (or UCL) concentrations of COPC in the fill materials and natural soils are to be less than the health and ecological based assessment criteria in the AECs.
- Where 95% UCL concentration are more than the health based assessment criteria then further assessment and/or management would be required. This could include assessing individual results and/or undertaking a Tier 2 risk assessment.
- Where concentrations of groundwater COPC are more than the health based and ecological criteria then further assessment and/or management would be required. This could include assessing individual results and/or undertaking a Tier 2 risk assessment.

Health Investigation Levels and Health Screening Levels

- Where data sets are not sufficiently populated to calculate a 95% UCL then individual results are to be less than the health based assessment criteria. Where individual concentrations are more than the health based assessment criteria then further assessment and/or management would be required. This could include assessing individual results and/or undertaking a Tier 2 risk assessment.
- Where the 95% UCL can be calculated, the 95% UCLs are to be less than the health based assessment criteria and no individual results in the data set are to be greater than 250% of the assessment criteria; and the standard deviation of the data set is to be within 50% of the assessment criteria.
- Where the 95% UCL is more than the assessment criteria then further assessment and/or management would normally not be required.

Environmental Investigation Levels and Ecological Screening Levels (ESL)

- Data is to be compared directly to environmental based assessment criteria. Where individual concentrations are more than the EILs / ESLs further assessment and/or management would be required. This could include assessing individual results and/or undertaking a Tier 2 risk assessment.

Background Levels

- Coffey will review published background ranges and utilise data held by Coffey relevant to the Site geological and soil profile to assess background concentrations for use in calculating EILs and ESLs.

Asbestos

- Visual observation of presence of asbestos in the form of ACM during our test pitting will be undertaken.
- Should material be observed that is suspected to contain asbestos, then pieces of that material will be submitted for confirmatory analysis.
- Where friable forms of asbestos are observed or suspected, assessment via the method outlined within the ASC NEPM (NEPC, 2013) and WA Department of Health (DoH) (2009) for calculation of % asbestos, or analysis of soil samples for the presence/absence of asbestos fines/fibres.

Step 6: Specify Limits of Decision Errors

There are two sources of error for input to decisions:

- Sampling errors, which occur when the samples collected are not representative of the conditions within the investigation area; and
- Measurement errors, which occur during sample collection, handling, preparation, analysis and data reduction.

The null hypothesis for this study is:

- Contaminant concentrations beneath the site are more than the adopted investigation levels.

These errors may lead to the following decision errors:

- Type I - deciding that the soil is not contaminated and, therefore, the site is suitable for the proposed residential development when the reverse is true; and
- Type II - deciding that the soil is contaminated and, therefore, the site is not suitable for the proposed residential development when the reverse is true.

The acceptable limit on decision errors is a 5% probability of a false negative (i.e. assessing that the average concentrations of CoPC in are less than the adopted soil investigation levels when they are actually greater than the investigation levels). Where data sets are sufficiently populated, the 95% Upper Confidence Limit (UCL) of the arithmetic mean will be used to calculate this probability.

The investigation levels for assessment are nominated in Section 7 of this report.

Step 7: Optimise the Design for Obtaining Data

Based on the previous Steps 1 to 6 of the DQO process, the optimal design for obtaining the required data is presented in the following sections.

7. Investigation work to address data gaps

7.1 Scope of Investigation Works

Site investigation works were undertaken by Coffey on 23 and 24 January 2017 (soil investigation), and on 11 and 19 April 2017 (groundwater investigation). The investigation locations are shown in Figure 2.

In summary, field works comprised:

Soil Investigation

- Location and clearance of underground services, and set out of proposed soil investigations at cleared locations.
- Excavations of six test pits denoted as TP3 to TP8, which extended to depths ranging between 1.4m and 2.4m below ground surface (mbgs).
- Drilling of 7 hand auger bores denoted as HA1 to HA7, which extended to a maximum depth of 1.1mbgs.
- Collection of soil samples from each of the above testing locations for submission to NATA accredited laboratory to be scheduled for analysis of a range of COPC.
- Chemical analysis of 21 primary soil samples from 12 sampling locations for a range of COPC.
- Implementation of a QA/QC program including chemical analysis of three intra-lab duplicate soil samples, one inter-laboratory duplicate soil sample, one equipment rinsate sample (i.e. one during the soil sampling programme) and two trip blank and trip spike samples.

Groundwater Investigation

- Location and clearance of underground services, and set out of proposed borehole locations at cleared locations.
- Drilling of three boreholes (BH1 to BH3) and conversion of the boreholes into groundwater monitoring wells (MW1 to MW3 respectively).
- Well development and purging.
- Collection of groundwater samples from the three groundwater monitoring wells for a range of COPC.
- Implementation of a QA/QC program including chemical analysis of one intra-laboratory water duplicate, one equipment rinsate sample (i.e one during the groundwater sampling program) and one trip blank and trip spike sample.

7.2 Sampling and Analysis Plan

7.2.1 Rationale for Sampling Pattern and Density

A detailed appraisal of the site's historical uses has not identified particular point sources of potential contamination within the site, as the site has been historically used for industrial activities, and no information regarding storage of chemicals on site has revealed.

Based on our review of available information, it is assessed that the main source of contamination for the site would arise from fill of unknown origin or quality which may have resulted in a randomly distributed contamination throughout the shallow soil profile (AEC1). As such, sampling locations were positioned to provide a regular sampling pattern across the site where this was practicable given existing site access constraints and buried services. Areas beneath the existing school buildings and pop-up school demountables were not accessible to conduct sampling.

The groundwater monitoring wells were positioned to provide coverage across the site to assess groundwater quality and flow direction (AEC 2, AEC 3 and AEC4). Figure 2 shows the locations of the groundwater monitoring wells.

On review of the available investigation data for the site, Coffey notes the following:

- Sixsteen (16) investigation locations (including three boreholes for monitoring wells) have been established within the site by Coffey as part of the current programme of investigation.
- Five (5) investigation locations were established within the site by Hibbs & Associates.

- Twelve (12) investigation locations were established by GeoEnvironmental Consultancy. Coffey note that no samples were collected from the GeoEnvironmental investigation locations for chemical analysis. However, borehole logs for these boreholes indicate that fill characteristics appear are reasonably consistent with ground conditions observed in Coffey test pits (i.e. similar fill types and anthropogenic inclusions). As the GeoEnvironmental borehole logs pesent information which informs the understanding of ground conditions at these locations, these locations are considered valid investigation positions.
- The investigation methods employed machine drilled boreholes, machine excavated test pits and hand augers, predominantly to characterise the soil materials beneath the site. Coffey recognise that hand augers and boreholes have limitations when characterising fill materials, as they are less conducive to allowing anthropogenic inclusions (including potential asbestos containing materials) than other investigation methods such as test pitting.
- Observations made of fill materials exposed along service trench excavations measureing between 65m and 90m, as illustrated on Figure 3.
- Table A of the Sampling Design Guidelines (NSW EPA, 1995) recommends 40 sampling positions for a 3.0 ha site. With regard to assessing fill materials, the investigation density was lower than the minimum investigation density recommended by the Sampling Design Guidelines (NSW EPA, 1995). The Sampling Design Guidelines recommend a systematic sampling programme where the distribution of contamination is expected to be random. Given the access restrictions present within the site, it was not possible to establish a systematic sampling grid, and therefore the distance between sampling locations in certain areas of the site is more than that recommended by the Sampling Design Guidelines. As such, the degree of uncertainty associated with unexpected contamination associated with fill materials present in these areas is assessed to be greater. Conversely, in other areas of the site where the distance between sampling locations is less, the degree of encountering unexpected contamination is assessed to be proportionally less.
- In the absence of specific point sources of potential contamination, groundwater monitoring wells were positioned across the site to assess flow conditions, and relative change in water quality conditions across the site.

Coffey considers that investigations completed are sufficient to characterise ground contamination conditions within the site. It is considered that uncertainty associated with the presence of potentially unidentified contamination between investigation positions and/or limitations of the investigation methods could be addressed either:

- As part of future ground investigations to refine the understanding of ground conditions in areas that were previously inaccessible; and/or,
- As part of contingency planning to manage unexpected finds of contamination during the proposed development works.

7.2.2 Investigation & Soil Sampling Methodology

In general, the investigation and soil sampling methodology is outlined in Table 7.1.

Table 7.1: Summary of Investigation and Soil Sampling Methodology

Activity	Detail / Comments
Below Ground Service Clearance	A DBYD Underground Services Check was carried out prior to commencement of works. Investigation locations were also scanned by an underground service clearance sub-contractor to check for the presence of below ground services. Testing locations were set up in areas cleared for below ground services.

Activity	Detail / Comments
Test Pits	Test pit locations were conducted with the aid of an excavator. Soil material excavated from each testing location were placed on thick plastic to minimise the potential to contaminate the adjacent surface soils. Soil samples were collected directly from the centre of the excavator bucket using a gloved hand. Excavated soils were reinstated into the test pit, and the ground returned to its original conditions following sampling. As a guide, soil samples were collected from the near surface (0.05-0.1m), 0.5m 1.0m and then every metre thereafter until target depth (3.0m bgs), natural material was encountered or refusal (whichever occurred first).
Hand Augering	Seven additional soil sampling locations were established within the site where access restrictions did not allow machine excavated test pits. Each sampling location was advanced using a hand auger to a target depth maximum depth of 1.1mbgs, or refusal (whichever occurred first). The grass covering at each borehole location was removed and set aside prior the commencement of hand augering. Soil material excavated from each testing location were placed on thick plastic as to not contaminate the adjacent surface soils. Disturbed soil samples were collected directly from the hand auger. Once the target depths had been reached, or refusal, the borehole was backfilled with remaining soil material, and the loose grass covering was re-instated.
Soil Logging	Soil logging was undertaken by a suitably qualified and experienced Coffey scientist in accordance with Coffey's Standard Operating Practices (SOP), which is consistent with AS 1726-1993, Geotechnical Site Investigations and AS 4482.1-2005 Guide to the investigation and sampling of sites with potentially contaminated soil.
Soil Sampling	All intrusive works were directed by the scientist supervising the works. All soil logging and field screening sampling works were carried out by the Coffey scientist. In general, soil samples were collected to target different horizons within fill materials and then at approximately each one metre intervals thereafter or at changes in soil horizon or where indications of potential contamination were noted. Soil samples collected were placed as quickly as practicable into sample jars. Sample jars were filled to the top to minimise headspace. Visual, olfactory, and field screening data were recorded (refer Field Logs; Appendix C). Separate soil samples for asbestos analysis (approximately 50g mass) were collected and placed in double zip lock bags. Fragments suspected to contain asbestos that were collected for asbestos analysis were placed in double zip lock bags.
Soil Splitting	Duplicate samples were collected by dividing soils collected from the hand auger or excavator bucket and split into two laboratory jars. Blind duplicate samples were denoted 'DUP' (e.g. DUP01, DUP02 etc.). Inter laboratory duplicate samples were labelled with the suffix 'A' (e.g DUP01A)
Soil Headspace Screening	Field headspace screening using a Photoionisation Detector (PID) with a 10.6eV lamp was undertaken where possible to assess the potential presence of VOC to guide scheduling of chemical testing. Soil headspace screening was undertaken on soils at discrete depths at each borehole location by placing a small quantity of soil inside a zip-locked plastic bag and sealed. The

Activity	Detail / Comments
	sample was agitated and then the plastic bag was pierced using the tip of the PID. The readings on the PID were observed and the maximum reading recorded on the field log sheet. The PID readings are presented in each borehole log. PID calibration records are provided within Appendix D.
Sample Handling and Transportation	Sample collection, storage and transport were conducted in general accordance with the relevant Coffey SOP. Soil samples were immediately placed into laboratory supplied glass jars, with Teflon lined seals to limit possible volatile loss and placed into an ice chilled cooler. The samples were dispatched to the laboratories under chain of custody control.
Decontamination of sampling equipment	Sampling equipment was decontaminated by scrubbing with Decon 90 solution and rinsed with potable water between samples. The rinsate blank sample was collected by pouring laboratory distilled water over non-disposable sampling equipment (hand auger) following decontamination to assess the efficiency of field decontamination procedures and assess the potential for cross contamination to occur between sampling positions. One rinsate blank sample was collected off the hand auger during the soil sampling programme following decontamination

7.2.3 Groundwater Sampling Methodology

The methodology to install, develop and sample groundwater monitoring wells on the site is outlined in Table 7.2.

Table 7.2: Groundwater Well Installation, Development and Sampling Methods

Activity	Detail / Comments
Well Installation	Three boreholes, BH01, BH02 and BH03 were drilled, each of them being converted to groundwater monitoring wells (MW01 to MW03). Each well was constructed with lengths of 50mm diameter screw threaded casing. A length of machine slotted casing was positioned to intercept groundwater, with lengths of solid casing extended to the surface. The well annulus was backfilled with fine gravel to the top of the screened interval. A 0.3m thick bentonite seal placed over the gravel pack. The remaining well void was backfilled with selected cuttings from the drilling. Bolted steel flush-fitting covers were used to complete each well at surface. Soil logs and groundwater well installation details are provided in Appendix C.
Well development	Well development was undertaken shortly after well installation. Each well was developed using a disposable bailer.
Groundwater Level & NAPL Measurements	Groundwater levels and the presence of Non Aqueous Phase Liquids (NAPL) were recorded using an oil/water interface probe (IP), which was calibrated by Thermofisher Scientific prior to use. Calibration certificates are provided within Appendix D.
Well Purging	Monitoring wells were purged and sampled in general accordance with the relevant Coffey SOP – Sampling with Low Flow Method. Prior to collecting a groundwater sample, each well was purged using a portable low flow peristaltic pump. Purging continued until water quality parameters stabilised (i.e. +/- 10%), or

Activity	Detail / Comments
	three equipment volumes were removed. Water drawdown was monitored during purging. Where drawdown was too high, purging was suspended to allow the well to recharge. During purging, field groundwater quality parameters including pH, Temperature, Dissolved Oxygen, Electrical Conductivity and Redox Potential were monitored with a calibrated water quality meter (WQM). Equipment calibration records are located in Appendix D. Groundwater samples were collected in the following order: Volatiles including VOC, VHC, BTEX and TRH C_6-C_{10}. Semi-volatiles including SVOC, TPH C_{10}-C_{36} and PAH. Inorganics and Heavy Metals. Purging recrods are provided in Appendix J.
Sampling Method	Groundwater samples were recovered from each of the monitoring wells using the dedicated tubing and low flow peristaltic pump in accordance with Coffey SOP. Sampling recrods are provided in Appendix J.
Sample Splitting	Duplicate samples were collected by filling up two sample containers simultaneously.
Decontamination Procedure	The IP and WQM was decontaminated by scrubbing with Decon 90 solution and rinsed with potable water between wells.
Sample Preservation	Samples were placed in laboratory supplied bottles containing appropriate preservatives with minimal headspace. Samples collected for metals were filtered in the field using 0.45µm disposable Waterra filter packs. Sample containers were immediately capped and placed in an insulated container filled ice. The samples were dispatched to NATA accredited laboratories under chain of custody control. Laboratory certificates and chain of custody documentation is provided in Appendix F.

7.3 Quality Assurance/Quality Control

A quality assurance/quality control plan was designed to achieve predetermined data quality objectives (DQOs) and to demonstrate accuracy, precision, comparability, representativeness and completeness of the data generated and the procedures for assessing the DQOs are met. A standalone Data Validation Assessment is presented within Appendix E.

The results of the Data Validation Assessment conclude that the data is directly usable for the purposes of this assessment.

7.4 Laboratory Details

Analysis was carried out by the following laboratories who hold NATA accredited analytical methods:

- Primary Laboratory – Eurofins MGT, Lane Cove NSW
- Secondary Laboratory - ALS Laboratory, Smithfield NSW

8. Assessment Criteria

8.1 General

Assessment criteria were selected with consideration of the current and future uses. The current and future use of the site will be for use as a primary school.

The criteria presented below are intended to apply to a Tier 1 risk assessment based on certain site-specific characteristics. Where concentrations of a COPC exceed the generic assessment criteria, then further consideration of the specific exposure pathway is required which may warrant further investigation, assessment or the development of a strategy to mitigate the potential risks identified.

8.2 Health Investigation & Screening Levels

With reference to the generic land uses described within Schedule B7 of ASC NEPM (NEPC, 2013), the Health Investigation Levels (HIL) and Health Screening Levels (HSL) for a generic low-density residential land use setting (HIL/HSL A) are appropriate for primary schools and their integral playgrounds. In consideration of the proposed development, Coffey considers that the adoption of HIL consistent with the conservative low density residential setting is reasonable and appropriate. As such, HIL A and HSL A values were adopted for the assessment of potential health risks to future site users from soils within the site.

The Health Investigation Levels (HIL) and Health Screening Levels (HSL) for generic commercial/industrial land use setting (HIL/HSL D) are considered appropriate to use to assess the health risk to future construction and maintenance workers in the instance a COPC exceeds the HIL/HSL A criteria.

8.2.1 Soils

The assessment criteria proposed for this project were sourced from:

- NEPC (2013) National Environment Protection (Assessment of Site Contamination) Amendment Measure (No. 1) 2013 (NEPM).
- Friebel and Nadebaum (2011); CRC Care Technical Report No. 10 – Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater.

For compounds where the allowable soil vapour HSL exceeds the chemical constituent saturation concentration, Health Screening Levels (HSL) for direct contact pathways listed in Table B4 of CRC CARE Technical Report No. 10 (Friebel and Nadebaum; 2011) have been adopted as the health risk screening level for this assessment. The values adopted assume conservative characteristics regarding site conditions; namely, sandy soil profile and contamination occurring within the upper 1m of soil.

Coffey considers that the HSL presented within CRC CARE Technical Report No. 10 were developed on a scientifically defensible basis and have been subject to independent and expert peer review prior to publication. Consequently, Coffey considers that the approach described in CRC CARE Technical Report No. 10 may be adopted for health risk screening for worker exposure by direct contact regarding the presence of petroleum hydrocarbons in the subsurface, within the limitations of that report.

NEPC (2013) provides guidance on the assessment of soils impacted by asbestos, including health screening levels for asbestos in soil for a range of land uses. Coffey notes that the soil sampling for the assessment of asbestos was not consistent with that recommended in Section 11 in Schedule B2, Guideline on Site Characterisation of NEPC (2013), in that bulk samples (10L volume recommended) were not collected for sieving and inspection for ACM and FA and samples for analysis of asbestos fibres (AF) were approximately 50g mass compared with the recommended 500g mass. For this reason, a preliminary assessment criterion of ‘no asbestos detected’ for all forms of asbestos was adopted.

A summary of the adopted health-based soil investigation levels is provided in Table 8.1. Table 1 provide a summary of the laboratory data against the adopted health based soil investigation levels.

Table 8.1: Soil Investigation Levels – Human Health

Chemical Constituent	Health Investigation Levels Adopted from HIL A (mg/kg) [1]
Arsenic	100
Cadmium	20
Chromium (VI)	100
Copper	6000
Nickel	400
Lead	300
Zinc	7400
Mercury	40
F1 (TRH C_6-C_9 excluding BTEX)	45
F2 (TRH C_{10}-C_{16} excluding Naphthalene)	110
F3 TRH C_{16}-C_{34}	4,500
F4 TRH C_{34}-C_{40}	6,300
Benzene	0.5
Toluene	160
Ethylbenzene	55
Total Xylene	40
Naphthalene	3
Carcinogenic PAH as Benzo(a)pyrene TEQ [4]	3
Total PAHs	300
PCB	1
Asbestos (as Bonded ACM, Asbestos fines and fibres)	No asbestos observed or detected
Aldrin + Dieldrin	6
Chlordane	50
DDT+DDE+DDD	240
Endrin	10
Endosulfan	270
Heptachlor	6
Methoxychlor	300

Toxaphene	20
Phenol	3000
VOCs and SVOCs	<LOR

Notes:

1. Table 1A(1) - Schedule B(1), Guideline on the Investigation Levels for Soil and Groundwater (NEPC, 2013)
2. Table 1A(3) - Schedule B(1), Guideline on the Investigation Levels for Soil and Groundwater (NEPC, 2013)
3. Table A4 – Soil Health Screening Levels for Direct Contact (CRC Care Technical Report No.10 (Friebel and Nadebaum; 2011)
4. TEQ = Toxicity Equivalent Quotient
5. Soils were tested for Total Chromium, which comprises both Chromium (III) and Chromium (VI) valence states. The HIL for Chromium (VI) has been adopted as a conservative assessment threshold.

Where SVOCs and VOCs are detected at concentrations above the laboratory LOR, health screening levels from other authoritative sources (e.g. USEPA Region 9) were used to assess the significance of potential risks.

8.2.2 Groundwater

HSLs are also applied to groundwater for assessing human health risk through the dominant vapour inhalation exposure pathway. Therefore, TRH and BTEX concentrations are assessed against the groundwater HSLs for vapour intrusion from the relevant depth and soil matrix applicable to “low-high density residential” land use (HSL A & HSL B) from the ASC NEPM (NEPC, 2013). However, it is noted that there are limitations with regard to the application of HSLs where the identified contamination has an atypical petroleum composition.

The HSLs for TRH and BTEX in groundwater from the amended NEPM (NEPC, 2013) are summarised in Table 8.2

Based on the dominant soil texture and the measured depth of standing water level, the HSLs for sandy soils with groundwater between 2m to <4m depth have been adopted. Coffey understands no basements have been proposed for the development.

Table 8.2: Summary of HSLs in Groundwater

Chemical	HSL A & HSLB – Low Density Residential Land Use (sandy soils) (mg/L) 2m to <4m
Benzene	0.8
Toluene	NL
Ethylbenzene	NL
Xylenes	NL
Naphthalene	NL
F1	6
F2	NL

NL: non-limiting (i.e. calculated risk level is above the solubility level for this chemical).

F1: C_6-C_{10} – BTEX

F2: >C_{10}-C_{16} - Naphthalene

8.3 Ecological Investigation & Screening Levels

8.3.1 Soil

Ecological investigation and screening levels have been considered for the site and adopted from NEPC (2013) National Environment Protection (Assessment of Site Contamination) Amendment Measure (No. 1) 2013 (NEPM). Table 8.3 below provides the adopted EILs and ESLs.

Table 8.3: Summary of EIL and ESL in Soils

Chemical	ESL & EIL – URBAN RESIDENTIAL AND PUBLIC OPEN SPACE (mg/kg)
Benzene	50
Toluene	85
Ethylbenzene	70
Xylenes	105
Naphthalene	170
Benzo(a)pyrene	0.7
F1 C6-C10	180
F2 C10-C16	120
F3 C16-C34	300
F4 C34-C40	2800
Arsenic	100
Chromium	203[3]
Copper	308[2]
Lead	1100
Nickel	175[4]
Zinc	522[1]
DDT	180

Notes:

ESLs for sandy soils have been selected for a conservative approach.

EILs have assumed an aged soil

Background concentrations obtained from “Element concentrations in soils in rural and urban areas of Australia (1995).

[1]Derived using a CEC of 10 cmol/kg (average site CEC = 17.5 cmol/kg), and a pH of 7.0 (average pH for site is 7.1).

[2]Derived using a pH of 6.5 (average pH for site is 7.1)

[3]Derived using a conservative clay value of 1%

[4]Derived using a CEC of 10 cmol/kg (average site CEC = 17.5 cmol/kg)

8.3.2 Groundwater Investigation Levels (GIL)

The amended NEPM (NEPC, 2013) describes the process involved in identifying the likely environmental values that must be considered during groundwater investigations at potentially contaminated sites. Based on this, assessment of relevant environmental values follows the steps below:

- Determine whether the aquifer beneath the site is included in the NSW Office of Water list of major aquifers of drinking water quality;
- Assess the identified uses of groundwater from the aquifer; and
- Use groundwater indicators to assess whether the aquifer is suitable for use as a drinking water source (i.e. based on measured concentrations of total dissolved solids (TDS) within the groundwater).

Based on these steps, Coffey identified the following:

- The groundwater underlying the site is not considered to be part of the NSW Office of Water list of major aquifers of drinking water quality.
- The site is situated within the Zone 2 of the Botany Groundwater Management Zone which restricts the abstraction of groundwater for domestic purposes. As such, drinking water was not considered to be a relevant environmental value.
- Potential receptors may include Alexandria Canal which are expected to be marine environments.

Based on the above, Coffey considers that potential beneficial uses of groundwater include:

- Protecting marine aquatic ecosystems.

Chemical concentrations in groundwater are assessed against criteria from the following guidelines:

- ANZECC &ARMCANZ (2000). National Water Quality Management Strategy. Australian and New *Zealand Guidelines for Fresh and Marine Water Quality.*

Assuming slightly to moderately disturbed ecosystems, freshwater criteria for protection of 95% of species were applied, except where contaminants are potentially bioaccumulative in which case the trigger values for protection of 99% of species have been used.

A summary of the adopted GILs is provided in Table 8.4.

Table 8.4: Summary of Groundwater Investigation Levels

Analyte	Groundwater Investigation Level ANZECC 2000 [1] (µg/L)
Arsenic	<LOR
Cadmium	5.5
Chromium (Total)	4.4[a]
Copper	1.3
Lead	4.4
Mercury	0.04
Nickel	70
Zinc	15

Analyte	Groundwater Investigation Level ANZECC 2000 [1] (µg/L)
TRH C_6-C_{10}	20[b]
TRH C_{10}-C_{16}	50[b]
TRH C_{16}-C_{34}	100[b]
TRH C_{34}-C_{40}	100[b]
Benzene	700
Toluene	<LOR
Ethylbenzene	<LOR
Xylene (m & p)	<LOR
o-Xylene	<LOR
Benzo(a)pyrene	<LOR
Naphthalene	70
Anthracene	<LOR
Phenanthrene	<LOR
Fluoranthene	<LOR
Ammonia	910
Nitrate	700[c]
VOC, SVOC, VHC	<LOR
Potassium Perchlorate	<LOR
Picric Acid (2,4,6-Trinitrophenol)	250[c]

1. Australian and New Zealand Environment and Conservation (2000) National Water Quality Management Strategy – Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Where insufficient data is available to derive a reliable trigger value, low reliability values have been adopted from Section 8.3.7 of ANZECC/ARMCANZ (2000)

(a) GIL for Chromium (VI) adopted for Chromium (Total) as a conservative assessment measure.

(b) In the absence of a nominated guideline value, the laboratory LOR has been taken as the nominal trigger value for the presence of Benzo(a)pyrene, Anthracene, Phenanthrene and TRH compounds in groundwater as will be used as the GIL (NSW DEC, 2007).

(c) In absence of marine criteria, the low reliability freshwater criteria has been adopted as recommended in Section 8.3.7.11 of ANZECC (2000).

Where Potassium Percholorate, SVOCs, VHCs and VOCs are detected at concentrations above the laboratory LOR, groundwater investigation levels from other sources (e.g. USEPA Region 9) will used to assess the significance of potential risks.

8.4 Management Limits

In accordance with Section 2.9 of NEPM Schedule B1, consideration of Management Limits has been undertaken to assess whether the reported soil conditions has the potential to pose a potential risk to buried infrastructure, fire and explosion hazards, or the formation of NAPL. A summary of the adopted management limits for this site is provided in Table 8.5.

Table 8.5: Summary of site management limits considered within this assessment

TRH Fraction	Soil Type	Management Limit for Residential, Parkland and Public Open Space Land Use (mg/kg)
F1: TRH C_6-C_{10}	Coarse	700
F2: TRH C_{10}-C_{16}	Coarse	1,000
F3: TRH C_{16}-C_{34}	Coarse	2,500
F4: TRH C_{34}-C_{40}	Coarse	10,000

9. Ground Conditions

9.1 Generalised Subsurface Conditions

The generalised subsurface conditions encountered across the site during the investigation comprised of variable fill material. Fill materials were underlain locally by marine sands. Bedrock was not encountered in the investigation. Field logs are presented in Appendix C.

Table 9.1 summarises subsurface conditions encountered in the boreholes.

Table 9.1 – Summary of Observed Subsurface Conditions

Unit	Depth to Top of Unit (mbgs)	Approx. Unit Thickness	Material Description
Fill	0m	0.9m to 1.8m	FILL with the general consistency of clayey sand and clay: Colouration ranged from brown to red to orange to grey. The clays were generally low plasticity, and the sands were fine to coarse grained. Some angular gravels were observed within the fill. Abundant anthropogenic materials including bonded cement fragments containing asbestos, concrete, plastic, tiles, wood and metal were noted.
Marine Sand	0.9m to 1.8m	Not proven	SAND: Fine grained, grey to brown.

Groundwater inflow was encountered within the boreholes at the following depths:

- BH1: 4.0m bgs
- BH2: 3.3m bgs
- BH3: 4.0m bgs

GeoEnvironmental Consultancy reported groundwater inflows at depths between 2.4m and 3.7mbgs.

The observed subsurface conditions are generally consistent with those reported in the Hibbs & Associates (2016) and GeoEnviro Consultancy (2016) environmental and geotechnical investigations.

9.2 Visual/Olfactory Indications of Contamination

No olfactory evidence of contamination or staining of soils was noted in any of the investigation locations. Hibbs & Associates or GeoEnvironmental Consultancy did not report visual/olfactory evidence of contamination.

Soil headspace measurements from soil samples collected from each of the Coffey investigation locations ranged from 1.1ppm to 9.1ppm, with most readings less than 5ppm which indicates that there is a low potential for VOC to be present in those soil samples. Soil headspace measurements are presented in field logs provided in Appendix C.

Bonded asbestos cement fragments were observed at the following locations during the investigation:

- TP5: Three bonded asbestos cement fragments (approximately 3cm x 3cm), angular to sub-angular. The asbestos fragments were in relatively strong condition and did not crumble with moderate hand pressure.
- TP6: Bonded asbestos cement fragment (4cm x 4cm), angular. The asbestos fragment was in relatively strong condition and did not crumble with moderate hand pressure.
- TP7: Bonded asbestos cement fragment (4cm x 4cm), sub-angular. The asbestos fragment was in relatively strong condition and did not crumble with moderate hand pressure.
- Soil surface adjacent TP7 (APS): Bonded asbestos cement fragment (3cm x 2cm), sub-angular. The asbestos fragments were in relatively strong condition and did not crumble with moderate hand pressure.

9.3 Groundwater Conditions

Groundwater sampling was conducted by an experienced Coffey Environmental Scientist on 19 May 2017.

Groundwater depths below the top of PVC casings were measured with an IP meter to detect the presence of NAPL. NAPL was not detected during the monitoring event. A summary of the groundwater depths measured across the site is presented in Table 9.2.

Table 9.2 – Summary of Groundwater Depths Measured Across Site

Groundwater Monitoring Well	Top of Casing Elevation (mAHD)[2]	Depth to Groundwater (mbTOC)	Groundwater Elevation (mAHD)
MW1	12.870	3.337	9.533
MW2	13.030	2.886	10.144
MW3	13.110	2.427	10.683

Based on standing water levels presented above, groundwater is assessed to flow in a south westerly direction.

Groundwater samples were observed to range between slightly cloudy and clear, and were all brown in colour, which was attributed to the fine sediment suspended in solution. No odours or sheens were observed in any of the groundwater purged from the monitoring wells or in samples submitted for laboratory analysis.

[2] Casing elevations obtained by subtracting 100mm height (i.e. typical distance of groundwater casings beneath gatic covers) from the groundwater monitoring well locations, and estimated based on the site topographic survey file provided by TKD (ref: 170410_Survey 44183DT[dated 12 April 2017]).

Table 9.3 below provides a summary of the water quality parameters measured from monitoring wells installed across the site.

Table 9.3 – Summary of Water Quality Parameters

Parameter	Range	Comments
Dissolved Oxygen (DO)	0.22 mg/L (MW3) to 0.5 mg/L (MW1)	Indicative of low dissolved oxygen levels
Electrical Conductivity (EC)	415 us/cm (MW3) to 590 us/cm (MW2)	Indicative of fresh water
Redox Potential	199 mV (MW3) to 329 mV (MW1)	Indicative of oxidising conditions
pH	5.65 (MW1) to 6.13 (MW2)	Indicative of slightly acidic conditions
Temperature	20.9^{0}C (MW1) to 20.6^{0}C (MW2)	-

Note: 199mV was added to the recorded redox value to convert data to standard hydrogen electrode (SHE) as per the manufacturers instructions.

9.3.1 Human Health

Soil

In summary, the concentrations of COPCs in soil samples were less than the adopted human health criteria for all of the samples analysed, with the exception of lead in sample TP3 0.4-0.6 (850 mg/kg), which exceeded the HIL A criteria.

Although no evidence of metallic inclusions were noted within the fill at TP3, the elevated concentration of lead may be attributable to lead-based paint attached to demolition rubble observed within fill at this sampling location, or attributable to historic activities undertaken at the site.

Further statistical analysis of the sample population of lead in fill was undertaken. The 95% upper confidence limit of the mean for lead within the fill was 156mg/kg (Appendix I), which is lower than the HIL of 300mg/kg. The standard deviation of the sample population was 154mg/kg, which is slightly higher than 50% of the HIL. It is noted that a samples of surface soils (0.0-0.1m) and deeper fill (1.2-1.3m) collected from TP3 reported a lead concentrations of 25mg/kg and 26mg/kg, respectively, which which are significantly lower than the HIL. These results also suggest that the lead impact is not elevated through the fill profile at this location. The depth at which the elevated concentration of lead was recorded (0.4-0.6m) is expected to restrict school students being exposured via the dermal contact, ingestion and dust inhalation pathways.

The concentrations of COPCs in soil samples were less than the adopted human health criteria (HIL D) for workers conducting construction activities and and future maintenance works involving subsurface excavations.

Fragments of cement sheeting suspected to contain asbestos (Bonded ACM) were collected from TP6, TP6 and APS and submitted for analysis. Laboratory analysis confirmed these materials contained asbestos. A fragment of similar material was also collected from TP5 and submitted for asbestos analysis, however the laboratory informed they could not locate the sample.

Figure 2 shows the locations where asbestos was identified during the investigation, and also shows the locations where asbestos was previously identified on site. Bonded ACM is likely to derive from the demolition of former structures on site. Bonded ACM is likely randomly distributed throughout the fill and given that the entire site was cleared of structures of a similar age during the same period, it is considered likely that Bonded ACM will also be present within the southern portion of the site.

Groundwater

The laboratory analytical results for groundwater are summarised in Table 5. In summary, the concentrations of COPCs in groundwater samples were less than the adopted human health criteria, with the exception of cis-1,2-dichloroethene (21ug/L in MW2), trichloroethene (14 ug/L in MW2), tetrachloroethene (51 ug/L in MW2) and vinyl chloride (6 ug/L in MW2), which were detected above the LOR.

For the assessment of vapour intrusion risk posed by the above chemicals, a soil vapour concentration at the source (ground water to soil gas interface) was calculated using the groundwater concentration multiplied by the Henrys Law constant (unitless). The soil vapour concentrations were subsequently compared to the interim soil vapour HSL A criteria. Table 9.4 presents a summary of the vapour screening assessment.

Table 9.4: Summary of groundwater vapour risk screening assessment.

Analyte	Maximum Concentration (ug/L)	Location of Max. Conc	Henry's Law Constant[1]	Soil Vapour Concentration mg/m^3	Interim Soil Vapour HSL A (mg/m^3)
Cis-1,2-dichloroethene	21	MW2	0.167	3.5	0.08
Trichloroethene	14	MW2	0.403	5.6	0.02
Tetrachloroethene	51	MW2	0.724	36.9	2
Vinyl Chloride	6	MW2	1.14	6.8	0.03

Notes:

1. Unitless Henry's Law Values taken from Risk Assessment Information System (https://rais.ornl.gov/), which was accessed on 9th May 2017)

The vapour screening assessment presented above indicates that cis-1,2-dichloroethene, trichloroethene, tetrachloroethene and vinyl chloride have the potential to pose a health risk via vapour ingress and inhalation pathway. The significance of this pathway required further consideration within the CSM.

9.3.2 Environment

Soil

The laboratory analytical results for soil are summarised in Table 1. In summary, the concentrations of COPCs in soil samples were less than the adopted ecological criteria, with the exception of benzo(a)pyrene in samples TP3 0.4-0.6 (1.4 mg/kg), TP7 0.9-1.0 (1.0 mg/kg) and TP8 0.4-0.6 (1.4 mg/kg).

Soil leachate analysis via the TCLP was conducted on samples that contained elevated concentrations of lead and benzo(a)pyrene. Whilst this analysis was conducted for waste classification purposes, the analysis indicates that benzo(a)pyrene is not leachable above the LOR. TCLP analysis of samples that reported elevated concentrations of lead, indicate that lead is leachable at concentrations above the corresponding GIL.

Groundwater

The laboratory analytical results for groundwater are summarised in Table 5. In summary, the concentrations of COPCs in groundwater samples were less than the adopted ecological investigation and screening levels, with the exception of copper in all three monitoring wells and TRH C_6-C_{10} in MW2.

Mercury, DDT, endrin, g-BHC, heptachlor, 2,4,6-trichlorophenol and pentachlorophenol were detected below the LOR, however the LOR exceeds the adoped ecological investigation levels. Coffey notes that the NSW DEC 2007 allows for the LOR to be used as a trigger value in these circumstances, of which these chemicals have not exceeded.

9.3.3 Management Limits

The reported concentrations of petroleum hydrocarbons did not exceed the management limits set out within Section 7.4. As such, the potential for soils to pose a risk to buried infrastructure, fire and explosion hazards, or the formation of NAPL is low.

The ASC NEPM requires aesthetics of soils to be considered when assessing sites. The investigation revealed:

- No highly malodours or stained soils were observed during the soil investigation;
- No hydrocarbon sheens were observed on surface waters; and
- No large amounts of monolithic deposits, putrescible refuse or animal residues were observed during the soil investigation.

Varying amounts of anthropogenic materials including those mentioned in section 9 were observed within fill material at the testing locations conducted. At the soil surface the amount of anthropogenic materials noted were significantly less than those noted within the fill at depth. Bonded ACM was observed within the fill, and on the soil surface at location APS.

9.3.4 Acid Sulfate Soils

The investigations conducted on site did not encounter natural soils consistent with estuarine deposits, however these may be present on site, particularly on the southern portion of the site. These soils, if encountered may require further consideration during construction.

9.3.5 Preliminary Waste Classification

The preliminary waste classification of soil materials encountered during the investigation works was conducted in general accordance with the procedures for classifying waste as detailed in the Waste Classification Guidelines - Part 1: Classifying Waste (NSW EPA, 2014). According to the Waste Classification procedure:

- The soil fill materials encountered on site are classified as special waste (bonded asbestos) as described within the Waste Classification Guidelines. Fragments of bonded asbestos cement sheeting were observed within fill material of test pits TP5, TP6 and TP7, and on the soil surface adjacent TP7. Anecdotal evidence from the construction manager of the pop-up school reveals bonded ACM was also encountered within sub-surface service excavations within the northern section of the site. A detailed appraisal of the site’s history reveals that asbestos contamination is likely to be randomly distributed throughout the fill on site. Fill material from the site is classified as Special Waste and should be managed as Asbestos Waste.
- The materials are not a liquid waste;
- The materials do not possess hazardous characteristics as defined under the Australian Code for the Transport of Dangerous Goods by Road and Rail;
- The materials consisted predominantly of soil and thus is deemed to be non-putrescible; and
- Soil material observed was not considered to be consistent with wastes that are currently pre-classified by the NSW EPA.

Chemical characterisation of the soil materials was undertaken to evaluate the waste classification of this material. Table 3 in presents a comparison of the laboratory results with the criteria set out within Waste Classification Guidelines – Part 1 Classifying Waste (NSW EPA, 2014). In summary, the analysis of soil samples reported concentrations of COPC's below the respective CT1 assessment thresholds for all COPCs, except for lead in samples HA04 0.8-1.0 (110 mg/kg), TP3 0.4-0.6 (850 mg/kg – exceeding CT2 assessment) and TP4 0.5-0.6 (130 mg/kg), and benzo(a)pyrene in samples TP3 0.4-0.6 (1.4 mg/kg), TP7 0.9-1.0 (1 mg/kg) and TP8 0.4-0.6 (1.4 mg/kg). Subsequent soil leachate analysis via the Toxicity Characteristic Leaching Procedure (TCLP) conducted on lead (samples TP3 0.4-0.6, TP4 0.5-0.6 and TP8 0.4-0.6) and benzo(a)pyrene (samples TP3 0.4-0.6 and TP8 0.4-0.6) reported below the TCLP1 and SCC1 criteria. It should be noted that due to a laboratory log error, the TCLP analysis for benzo(a)pyrene on sample TP8 0.4-0.6 was conducted on the 28 February 2017, exceeding the recommended holding time.

On this basis, the preliminary waste classification of fill material within the site is General Solid Waste (non-putrescible) to be managed as Special Waste (asbestos).

Coffey considers that this represents a preliminary waste classification because areas of the site remained inaccessible to investigatioin plant, and drilling methods were used in areas where access restrictions applied. Observations from hand augered bores may not represent the type and extent of inclusions which could remain undetected by drilling.

10. Conceptual Site Model

10.1 Sources of Contamination

The following sources of contamination have been identified:

- Fragments of bonded asbestos cement sheeting (Bonded ACM) within fill across the site.
- Lead within sample location TP3 0.4-0.6.
- Chlorinated hydrocarbons detected in groundwater above the adopted health screening levels in MW2.
- Fill materials containing concentrations of Benzo(a)pyrene that exceeds ecological criteria.
- Copper in all three monitoring wells and TRH C_6-C_{10} within MW2 that exceed the ANZECC (2000) marine aquatic criteria.

10.2 Exposure Pathways

The environmental pathways and exposure routes by which contaminants identified at the site may reach environmental and human receptors are assessed to include:

- Inhalation of dusts, vapours and fibres
- Dermal contact
- Ingestion
- Vertical and lateral contaminant migration through the saturated zone
- Contaminant migration along preferential flow pathways
- Plant uptake

10.3 Receptors

10.3.1 Ecological Receptors

The primary ecological receptor identified in relation to the site is aquatic species within the Alexandria Canal, which is located approximately 900m south west of the site.

Landscaping that exists within the site, and will be introduced as part of the proposed development have also been considered as a potential ecological receptor.

10.3.2 Human Receptors

The following current or future human receptors are identified:

- Current and future occupants of the site including school teachers, and primary/secondary school students (i.e. children aged between 5 and 18).
- Construction workers present on site during the redevelopment of the site.
- Workers conducting subsurface excavations as part of future maintenance events.
- Users of adjoining land.
- Trespassers

10.4 Plausible Exposure Pathways

The followings sections present a discussion of the plausible exposure pathways associated with ground conditions recorded on site in the context of the current and proposed future use of the site as a primary school.

10.4.1 Human Health

Table 10.1 provides a summary of the plausible exposure pathways relevant to the human receptors identified above. The following symbols have been used within the table to illustrate the completeness of the exposure pathway:

Table 10.1: Summary of plausible exposure pathways for human receptors

Receptor	Media	Plausible Exposure Pathway (No Mitigation)				Discussion of Pollutant Linkages
		Vapour Inhalation	Dust/fibre Inahalation	Ingestion	Dermal Contact	
Current / Future School Site Users	Soil & Groundwater	p	**P**	p	p	Current and future school site users including teachers and school students may be exposed to asbestos and lead in fill, and hydrocarbon vapours from impacted groundwater. <u>Asbestos</u> Fragments of Bonded ACM were identified within the fill throughout the site during intrusive investigations, and during contractor construction works in the temporary pop up school site. The materials identified in the did not exhibit significant signs of excessive weathering, indicating there is a lower potential for significant proportion of asbestos fines. Bonded ACM in good condition present a low risk to current and future school users, where the Bonded ACM

Receptor	Media	Plausible Exposure Pathway (No Mitigation)				Discussion of Pollutant Linkages
		Vapour Inhalation	Dust/fibre Inahalation	Ingestion	Dermal Contact	
						remains in such conditions. Damage to fragments of Bonded ACM (e.g. during construction or future maintenance events) has the potential to release fibres that may increase risks to school users and teaching staff . Lead Lead was detected at levels exceeding the HIL A criteria in TP3 0.4-0.6. The lead potentially derives from paints on demolition materials observed within the fill at this location. The sample was collected from approximately 0.5m bgs and as such does not present an unacceptable risk to school students, however if soils are overturned/mixed during site development, elevated concentrations of lead may pose a increased health risks to school students via inhalation, dermal and ingestion pathways. The risk is considered low to current and future students (depending on the site development activities in the vicinity of TP3). Groundwater Cis-1,2-dichloroethene, trichloroethene, tetrachloroethene and vinyl chloride were detected above the adopted health investigation criteria, and has the potential to pose a health risk via vapour ingress and inhalation pathway. This pathway would only be considered potentially complete where where a building exists over the areas where these volatile hydrocarbons have been detected. School children and users of the site are unlikely to come into direct contact with groundwater within the site.
Construction Workers during redevelopment **Maintenance worker (future subsurface maintenance event)**	Soil / Groundwater	**P**	**P**	p	p	Construction and future maintenance workers conducting subsurface excavations may be exposed to contaminated fill materials via dermal contact, inhalation of dust/fibres, and to hydrocarbon vapours from impacted groundwater. Asbestos As noted above, damage to fragments of Bonded ACM during future construction and maintenance works has the potential to release fibres that may be inhaled by workers. Lead Lead was detected at levels below the HIL D criteria and as such does not pose a risk to future construction and maintenance workers. Groundwater Cis-1,2-dichloroethene, trichloroethene, tetrachloroethene and vinyl chloride were detected above the adopted health investigation criteria, and has the potential to pose a health risk via vapour ingress and inhalation pathway in indoor situations only. It is assumed that the proposed earthworks will involve shallow trenching only, and as such vapour inhalation from shallow trenches is unlikely due to dilution with ambient air. Similarly the dermal contact and accidential groundwater ingestion risk is low as the shallow trenches are unluikely to intercept groundwater. Should interaction with groundwater be required for the proposed development, this assumption should be reviewed.

Receptor	Media	Plausible Exposure Pathway (No Mitigation)				Discussion of Pollutant Linkages
		Vapour Inhalation	Dust/fibre Inahalation	Ingestion	Dermal Contact	
Users of Adjoining land	Soil / Groundwater	p	**P**	n	p	Users of adjoining land may be exposed to contaminated fill during site redevelopment activities where dusts and/or fibres become airborne. Groundwater contamination can migrate laterally, extending beyond the site boundary. Current data suggests offsite migration of VHCs is not occurring, however this can not be ruled out due to the following: • VHCs are denser than water, and may be migrating beneath the maximum depth of MW1. • The VHCs may be striking an impermeable geological layer, hence flowing in another direction (i.e: not flowing in in the direction of indicated groundwater flow). Adjoining site users may be exposed to contamination in groundwater, via vapour inhalation pathway, and dermal contact with groundwater that seeps into basements (if any). Cis-1,2-dichloroethene, trichloroethene, tetrachloroethene and vinyl chloride were detected above the adopted health investigation criteria, and has the potential to pose a health risk via vapour ingress and inhalation pathway. The significance of this pathway should be further considered.
Trespassers		n	**P**	n	n	Trespassers may come into contact with fill material contaminated with asbestos where dusts and/or fibres become airborne. Tresspassers are unlikely to come into contact with groundwater beneath the site.

Notes:

P = plausible complete pathways

p = partially complete pathway depending on site conditions/exposure scenario

n = pathway not complete

10.4.2 Ecological Receptors

Soil

The B(a)P is likely to derive from building materials and rubble within the fill. Coffey notes that vegetation on site appeared healthy, and that TCLP results indicate a low potential for B(a)P leachability. Risks to new landscaping within the site could be managed by planting in imported soil mediums with appropriate capillary and root breaks. For these reasons Coffey conclude that there is a low risk to ecological receptors on site from potentially contaminated soil.

Groundwater

The nearest water body and aquatic receptors are located in Alexandria Canal, approximately 950 down gradient of the site. Given the geographical distance to the canal, and the already degraded status[3] of the canal and groundwater within the Alexandria region, it is considered that groundwater from beneath the site is unlikely to pose an unacceptable risk to the canal.

The exceeding ecological concentrations were observed within all the monitoring wells on site, with the exception of VHCs and TRH C_6-C_{10} within MW2, This suggests that the chemicals are likely to be representative of background levels within the urban groundwater environment, rather than attributable to current and/or previous occupation of the site. Concentrations of VHCs and TRH C_6-C_{10} above the LOR were detected in MW2, however were not detected in the upgradient well (MW3) or the downgradient well (MW1). The data suggests the offsite migration of VHCs is not occurring, however this can not be ruled out due to the following:

- VHCs are denser than water, and may be migrating beneath the maximum depth of MW1.
- The VHCs may be striking an impermeable geological layer, hence flowing in another direction (i.e: not flowing in in the direction of indicated groundwater flow).

11. Conclusions & recommendations

11.1 Summary of site conditions & history

The site comprises an irregular, mostly rectangle parcel of land covering an area of approximately 2.7ha. At the time of the investigation the northern half of the site comprises a grassed playing field, with the western portion of the field being developed for temporary school classrooms. The southern half of the site comprises the existing school buildings, soft and hard surfaced play areas, and hard surfaced car park areas. Coffey understands these current building structures will be demolished as part of the proposed future redevelopment of the site.

Records indicate that the site was undeveloped in 1887. Between 1887 and 1893, the site was predominantly developed with terraced residential dwellings. By 1930, the site and surrounding areas were developed for commercial/industrial uses. The site housed several large warehouses until circa 1975 where all the structures on site were demolished. The warehouses were occupied by several businesses, including Murray Brothers (furniture manufacture), Federal Match Company (match manufacture). Land surrounding the site was also occipued by various industrial uses. By 1982, the current school buildings and grounds of Alexandria Park Community School were constructed on the southern half of the site. The northern half of the site remained vacant, and was possibly used as a sporting oval. Land uses surround the site have been developed recently for a mixture of commercial and residential uses.

11.2 Ground conditions

This report presents the findings of an investigation which aimed to assess contamination in the context of the proposed development. In summary, these investigations report:

- The site is underlain by a layer of variable fill material, which has been recorded to depths of 1.7m and 1.8m bgs. Fill within the site was observed to include large quantities of anthropogenic

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[3] The NSW EPA have declared the river bed sediments of the Alexandria Canal to be contaminated with chlorinated hydrocarbons including organochlorine pesticides (chlordane, total DDT and dieldrin), polychlorinated biphenyls (PCBs) and metals. A remediation order for the cancal has been issued on the 25 August 2000 as per Section 23 of the Contaminated Land Management Act 1997.

materials including concrete, plastic, tiles, wood and metal. Bonded asbestos cement fragments were observed and noted within the fill in various locations and depths across the site. These fragments did not exhibit significant signs of excessive weathering.

- Natural alluvial sand soils were encountered beneath the fill and were fine grained, grey to brown. Bedrock was not encountered during this investigation.
- With the exception of the bonded asbestos cement fragments observed within the fill and on the soil surface (APS), no other visual or olfactory indications of significant contamination were noted during the investigation.
- Groundwater ingress was noted at 3.3m bgs to 4.0m bgs within the boreholes conducted. Standing groundwater levels were measured between 2.427mbTOC (MW3) and 3.337mbTOC (MW1). Based on the observed groundwater levels, groundwater is expected to flow in a south-westerly direction.
- Observations of groundwater during sampling noted that no odours or visible sheens were noted in any of the groundwater wells within the site. No NAPL was detected within the groundwater wells sampled within the site.

11.3 Conclusions

The Conceptual Site Model developed as part of this assessment has identified plausible pollutant linkages, which require further consideration, particularly during site redevelopment. The following plausible pollutant linkages require further consideration:

- Fragments of bonded asbestos cement sheeting (bonded ACM) has been identified within fill in various locations throughout site, and it is considered to be randomly distributed throughout the fill on site. Bonded ACM was generally observed to be in relatively strong and unweathered conditions and did not crumble under moderate hand pressure. Disturbance during periodic maintenance events (e.g. lawn mowing), and during the proposed site development works has the potential to damage the cement which bonds asbestos fibres within a solid matrix, and can spread the materials and/or result in the release of asbestos fines/fibres. Friable forms of asbestos present increased potential risks to health.
- Lead has been found on site above the HIL A criteria. As the elevated concentration has been found at 0.5m bgs along side building materials, the current risk to primary school students and current site users is considered to be low. Should site development activities turn over the fill material at depth, and deposit it on the soil surface, this assumption will need to be reviewed. The lead concentration does not pose a risk to commercial/industrial construction and maintenance workers as the concentration fell below the HIL A criteria.
- Vapour intrusion associated with concentrations of cis-1,2-dichloroethene, trichloroethene, tetrachloroethene and vinyl chloride detected in MW2.

Based on the findings of the investigation, it is concluded that the site can be made suitable for the proposed development, subject to:

- Preparation of a Remedial Action Plan (RAP) for the site, to mitigate the health risks associated with the pollutant linkages outlined above.

In summary, following a review of the available site history information and available investigation data, Coffey concludes that some uncertainty remains regarding:

- The presence of potentially unidentified contamination in fill, particular in areas beneath the existing school buildings where access was restricted, and between investigation positions.
- The lateral and vertical extent of groundwater impacted with VHC.

However, Coffey considers that investigations carried out to date are adequate for the purpose of:

- Characterising the nature of contamination within fill material expected within the site for the type and extent of redevelopment proposed.
- Developing a Conceptual Site Model and strategy to manage the known types of contamination present within the site to make the site suitable for the proposed uses.
- Establishing historic site users to develop a framework to manage the above data gaps and unexpected contamination encountered during the redevelopment of the site.

Based on the data collected from this investigation, the preliminary waste classification of fill material within the site would be classified as General Solid Waste (non-putrescible) managed as Asbestos Waste. Due to access restrictions, investigation methods employed and absence of information describing where development excavations will occur, there remains some uncertainty whether wastes of other classifications that exist within the site.

11.4 Recommendations

Based on the findings of the current and previous phases of investigation, it is recommended that a RAP is developed in accordance with the guidance set out within the ASC NEPM (NEPC, 2013) and other guidance published or endorsed by the NSW EPA. It is recommended that the RAP specifically addresses the following aspects:

- A strategy to mitigate potential risks identified associated with bonded asbestos in fill material. The following remediation approach is considered applicable at this stage:
  - Conduct a detailed walkover survey of the site to identify and remove visible fragments of bonded ACM fragments in shallow soils, prior to demolition and redevelopment of the site. Remove building products containing hazardous materials prior to demolition. Conduct a subsequent walkover survey following the demolition of the site buildings to check for visible fragments of bonded ACM fragments in shallow soils.
  - Excavation of fill materials locally where subsurface excavation is required by the design, and off-site disposal to a licensed landfill.
  - Use cover layers to separate site users of the site from soils remaining on site that contain asbestos. Cover layers may comprise either hard surfaced areas (e.g. buildings, hard paved areas), or soil cover of a certain thickness and composition. This remedial strategy would trigger the need for an Environmental Management Plan (EMP) that details the type(s) and extent of cover layers installed, and protocols to inspect, reinstate and maintain the cover layer.
- The groundwater sampling conducted has indicated a potential vapour intrusion risk may exist. It is recommended a site specific risk assessment for vapour intrusion risk be conducted to determine if a vapour risk exists, with reference to the detailed design of the school. Should the risk assessment determine a positive vapour risk, mitigation measures shall be also be included within the RAP.

The RAP shall also document:

- A list of permits, licenses and notifications required to implement the remediation works.
- An site management plan including site set up controls and monitoring works to assess the effectiveness of the plan.
- A strategy to manage unexpected finds of contamination, based on site history and uncertainties associated with the presence of potentially unidentified contamination between investigation positions and limitations of the investigation methods employed.
- A procedure to classify soil materials excavated from site as part of the site redevelopment process.
- Remediation validation protocols and reporting requirements.

Potential Acid Sulfate Soils were additionally identified in the EIS (2017) Acid Sulfate Soils Assessment below RL5mAHD. Based on the proposed development, it is considered unlikely that these soils would be disturbed, however if soils below RL5mAHD are disturbed, or the water table is lowered below RL5mAHD, appropriate management would be required.

This document should be read with reference to the 'Important Information about Your Coffey Environmental Report' which follows References.

12. References

ANZECC (2000) Australian Water Quality Guidelines for Fresh and Marine Waters.

Australian Soil Resource Information System; Acid Sulfate Soil Risk Map: Botany Map No 9130S3.

Australian Standard AS:1726(1993); Geotechnical Site Investigations.

Australian Standard AS 4482.1 (2005); Guide for the Investigation of Sites with Potential Contaminated Soil.

DEC (2006); Guidelines for the NSW Site Auditor Scheme, 2nd Ed.

DECC (2009); Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997.

DUAP/NSW EPA (1998); Managing Land Contamination: Planning Guidelines [State Environmental Planning Policy No. 55 Remediation of Land].

Environmental Investigation Services (2017), Acid Sulfate Soil Assessment, proposed New School Facilities, Alexandria Park Community School, 7-11 Park Road, Alexandria.

Friebel and Nadebaum (2011); CRC CARE Technical Report No. 10: Health Screening Levels for Petroleum Hydrocarbons in Soil.

GeoEnviro Consultancy Pty Ltd (2016); Geotechnical Investigation, Proposed Temporary School Buildings, Alexandria Park High School, Park Street, Alexandria NSW (REF: JG16980A-r1; dated September 2016).

Hibbs & Associates (2016); Phase 1 and Limited Soil Sampling Investigation, Waterloo High School (Ref: S9179; dated July 2016).

Kass, T. (July 2016); *A History of the Site Alexandria Park Community School – Park Road – Junior Campus and Oval.*

NEPC (2013) National Environment Protection (Assessment of Site Contamination) Amendment Measure (NEPM) (No. 1) as registered and amended in 2013, and associated Schedule B guidelines.

NSW EPA (2014); Waste Classification Guidelines - Part 1: Classifying Waste.

NSW EPA (1995) Sampling Design Guidelines.

NSW EPA (2011); Guidelines for Consultants Reporting on Contaminated Sites.

NSW Geological Survey (1983); Sydney 1:100,000 Geological Sheet No. 9130.

Important information about your **Coffey** Environmental Report

Introduction

This report has been prepared by Coffey for you, as Coffey's client, in accordance with our agreed purpose, scope, schedule and budget.

The report has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared, and the opinions, recommendations and conclusions set out in the report are made in accordance with generally accepted principles and practices of that profession.

The report is based on information gained from environmental conditions (including assessment of some or all of soil, groundwater, vapour and surface water) and supplemented by reported data of the local area and professional experience. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry practice,

This interpretation is not a complete description of all material on or in the vicinity of the site, due to the inherent variation in spatial and temporal patterns of contaminant presence and impact in the natural environment. Coffey may have also relied on data and other information provided by you and other qualified individuals in preparing this report. Coffey has not verified the accuracy or completeness of such data or information except as otherwise stated in the report. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

Your report has been written for a specific purpose

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to an adjacent site or area, nor can it be used when the nature of the specific purpose changes from that which we agreed.

For each purpose, a tailored approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible quantify, risks that both recognised and potential contamination pose in the context of the agreed purpose. Such risks may be financial (for example, clean up costs or constraints on site use) and/or physical (for example, potential health risks to users of the site or the general public).

Limitations of the Report

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete.

This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of contamination or other environmental hazards can change over time, as a result of either natural processes or human influence. Coffey should be kept appraised of any such events and should be consulted for further investigations if any changes are noted, particularly during construction activities where excavations often reveal subsurface conditions.

In addition, advancements in professional practice regarding contaminated land and changes in applicable statues and/or guidelines may affect the validity of this report. Consequently, the currency of conclusions and recommendations in this report should be verified if you propose to use this report more than 6 months after its date of issue.

The report does not include the evaluation or assessment of potential geotechnical engineering constraints of the site.

Interpretation of factual data

Environmental site assessments identify actual conditions only at those points where samples are taken and on the date collected. Data derived from indirect field measurements, and sometimes other reports on the site, are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Variations in soil and groundwater conditions may occur between test or sample locations and actual conditions may differ from those inferred to exist. No environmental assessment program, no matter how comprehensive, can reveal all subsurface details and anomalies. Similarly, no professional, no matter how well qualified, can reveal what is hidden by earth, rock or changed through time.

The actual interface between different materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of a suitably qualified and experienced environmental consultant through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other unrecognised features encountered on site. Coffey would be pleased to assist with any investigation or advice in such circumstances.

Recommendations in this report

This report assumes, in accordance with industry practice, that the site conditions recognised through discrete sampling are representative of actual conditions throughout the investigation area. Recommendations are based on the resulting interpretation.

Should further data be obtained that differs from the data on which the report recommendations are based (such as through excavation or other additional assessment), then the recommendations would need to be reviewed and may need to be revised.

Report for benefit of client

Unless otherwise agreed between us, the report has been prepared for your benefit and no other party. Other parties should not rely upon the report or the accuracy or completeness of any recommendation and should make their own enquiries and obtain independent advice in relation to such matters.

Coffey assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report.

To avoid misuse of the information presented in your report, we recommend that Coffey be consulted before the report is provided to another party who may not be familiar with the background and the purpose of the report. In particular, an environmental disclosure report for a property vendor may not be suitable for satisfying the needs of that property's purchaser. This report should not be applied for any purpose other than that stated in the report.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, a suitably qualified and experienced environmental consultant should be retained to explain the implications of the report to other professionals referring to the report and then review plans and specifications produced to see how other professionals have incorporated the report findings.

Given Coffey prepared the report and has familiarity with the site, Coffey is well placed to provide such assistance. If another party is engaged to interpret the recommendations of the report, there is a risk that the contents of the report may be misinterpreted and Coffey disowns any responsibility for such misinterpretation.

Data should not be separated from the report

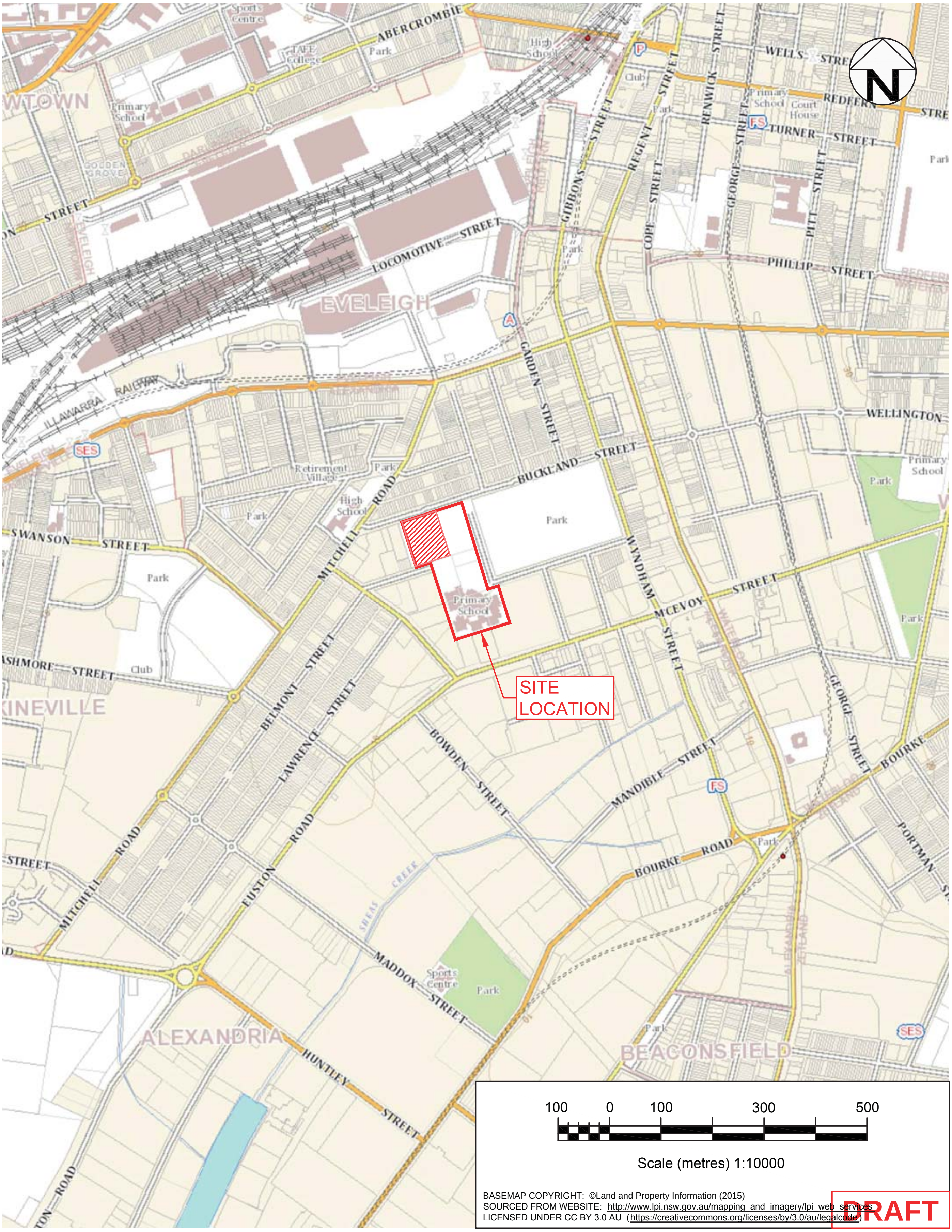
The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs, field testing and laboratory evaluation of samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

This report should be reproduced in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

Responsibility

Environmental reporting relies on interpretation of factual information using professional judgement and opinion and has a level of uncertainty attached to it, which is much less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. As noted earlier, the recommendations and findings set out in this report should only be regarded as interpretive and should not be taken as accurate and complete information about all environmental media at all depths and locations across the site.

Figures



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approved	ML		project:	ALEXANDRIA PARK COMMUNITY SCHOOL PARK ROAD, ALEXANDRIA, NSW
date	18 / 04 / 17			
scale	AS SHOWN		title:	SITE LOCATION
original size	A4		project no: 754-SYDEN199382-R01	figure no: FIGURE 1 rev: A

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LEGEND

- TEST PIT LOCATIONS
- HAND AUGER LOCATIONS
- MONITORING WELL LOCATIONS
- BOREHOLE LOCATIONS HIBBS □ ASSOCIATES (2016)
- BOREHOLE LOCATIONS - GEOENVIRO CONSULTANCY (2016)
- HAND AUGER LOCATIONS - GEOENVIRO CONSULTANCY (2016)
- APPROXIMATE POP-UP SCHOOL SITE FENCE
- APPROXIMATE ALEXANDRIA SCHOOL SITE BOUNDARY

NOTE: PREVIOUS SAMPLING LOCATIONS PROVIDED BY CLIENT FROM PLANS BY GEOENVIRO CONSULTANCY, AND HIBBS □ ASSOCIATES

PLOT DATE: 18/04/2017 5:12:00 PM DWG FILE: \\TTS779FS1.TT.LOCAL\DATA\1. PROJECTS\1. SYDENENV\2016\SYDEN199382 - ALEXANDRIA SCHOOL\CAD\754-SYDEN199382-R01.DWG

revision

no.	description	drawn	approved	date
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Scale (metres) 1:1250

drawn	FA / AR
approved	ML
date	18 / 04 / 17
scale	AS SHOWN
original size	A3

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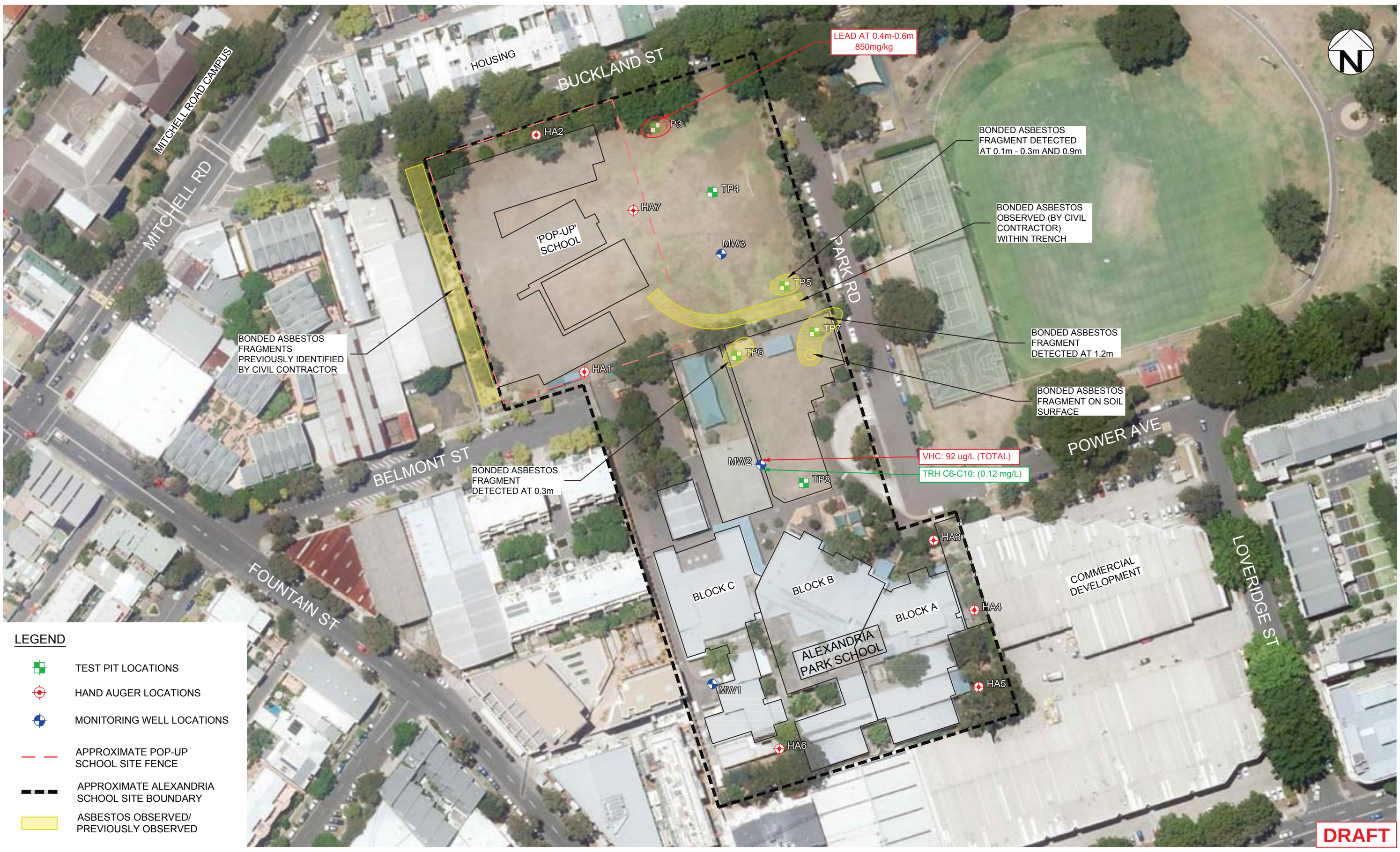
A TETRA TECH COMPANY

client:	TKD ARCHITECTS PTY LTD
project:	ALEXANDRIA PARK COMMUNITY SCHOOL PARK ROAD, ALEXANDRIA, NSW
title:	SITE LAYOUT
project no:	754-SYDEN199382-R01
figure no:	FIGURE 2
rev:	A



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original size	A3

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A TETRA TECH COMPANY

client:	TKD ARCHITECTS PTY LTD
project:	ALEXANDRIA PARK COMMUNITY SCHOOL PARK ROAD, ALEXANDRIA, NSW
title:	HUMAN HEALTH INVESTIGATION CRITERIA EXCEEDANCES
project no:	754-SYDEN199382-R01
figure no:	FIGURE 3
rev:	A

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original size	A3

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A TETRA TECH COMPANY

client: TKD ARCHITECTS PTY LTD

project: ALEXANDRIA PARK COMMUNITY SCHOOL
PARK ROAD, ALEXANDRIA, NSW

title: ECOLOGICAL HEALTH INVESTIGATION CRITERIA EXCEEDANCES

project no: 754-SYDEN199382-R01 | figure no: FIGURE 4 | rev: A

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approved	ML
date	18 / 04 / 17
scale	AS SHOWN
original size	A3

coffey
A TETRA TECH COMPANY

client:	TKD ARCHITECTS PTY LTD
project:	ALEXANDRIA PARK COMMUNITY SCHOOL PARK ROAD, ALEXANDRIA, NSW
title:	HISTORICAL BUSINESS ACTIVITIES
project no:	754-SYDEN199382-R01
figure no:	FIGURE 5
rev:	A

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client:	TKD ARCHITECTS PTY LTD
project:	ALEXANDRIA PARK COMMUNITY SCHOOL PARK ROAD, ALEXANDRIA, NSW
title:	HISTORICAL BUSINESS ACTIVITIES - 1950
project no:	754-SYDEN199382-R01
figure no:	FIGURE 5A
rev:	A

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original size	A3

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client: TKD ARCHITECTS PTY LTD

project: ALEXANDRIA PARK COMMUNITY SCHOOL
PARK ROAD, ALEXANDRIA, NSW

title: HISTORICAL BUSINESS ACTIVITIES - 1970

project no: 754-SYDEN199382-R01 | figure no: FIGURE 5B | rev: A

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date	18 / 04 / 17
scale	AS SHOWN
original size	A3

coffey
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client: TKD ARCHITECTS PTY LTD

project: ALEXANDRIA PARK COMMUNITY SCHOOL
PARK ROAD, ALEXANDRIA, NSW

title: HISTORICAL BUSINESS ACTIVITIES - 1991

project no: 754-SYDEN199382-R01 | figure no: FIGURE 5C | rev: A

Tables

Table 1: Soil Analytical Results

TKD Architects Pty Ltd, Alexandria Park Community School]

Chem_Group	ChemName	Units	EQL	NEPM 2013 HILs Residential A Soil	NEPM 2013 Residential Soil HSL A/B for Vapour Intrusion, 0 to <1m, Sand	NEPM 2013 Mgmt Limits Residential, parkland and public open space, Coarse Soil	NEPM 2013 ESLs Urban residential and public open space, Coarse Soil	NEPM 2013 EIL Urban residential and open public spaces (Aged)	HA01 0.0-0.1	HA02 0.0-0.1	HA04 0.0-0.1	HA04 0.8-1.0	HA05 0.0-0.1	HA05 0.4-0.5	HA06 0.0-0.1	HA07 0.0-0.1	TP3 0.0-0.1	TP3 0.4-0.6
								Sampled_Date-Time	24/01/2017	24/01/2017	24/01/2017	24/01/2017	24/01/2017	24/01/2017	24/01/2017	24/01/2017	23/01/2017	23/01/2017
								Matrix_Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
TPH	F2-NAPHTHALENE	mg/kg	50		110				<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	C6 - C9	mg/kg	20						<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C10 - C14	mg/kg	20						<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C15 - C28	mg/kg	50						<50	<50	<50	<50	<50	<50	<50	<50	<50	78
	C29 - C36	mg/kg	50						<50	<50	52	<50	<50	<50	<50	<50	<50	<50
	C10 - C36 (Sum of total)	mg/kg	50						<50	<50	52	<50	<50	<50	<50	<50	<50	78
	C10-C16	mg/kg	50			1000	120		<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	C16-C34	mg/kg	100			2500	300		<100	<100	<100	<100	<100	<100	<100	<100	<100	120
	C34-C40	mg/kg	100			10000	2800		<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	C6 - C10	mg/kg	20			700	180		<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
BTEX	Benzene	mg/kg	0.1		0.5		50		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Ethylbenzene	mg/kg	0.1		55		70		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Toluene	mg/kg	0.1		160		85		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Xylene (m & p)	mg/kg	0.2						<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Xylene (o)	mg/kg	0.1						<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Xylene Total	mg/kg	0.3		40		105		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
	C6-C10 less BTEX (F1)	mg/kg	20		45				<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Metals	Arsenic	mg/kg	2	100				100	2.7	<2	<2	<2	2.8	2.1	<2	2.2	2.3	6.1
	Cadmium	mg/kg	0.4	20					<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
	Chromium	mg/kg	5	100				203	12	8.5	12	7.8	10	8.6	<5	8.2	7.1	12
	Copper	mg/kg	5	6000				308	31	14	37	34	21	32	<5	13	16	230
	Lead	mg/kg	5	300				1100	74	28	81	110	60	48	<5	19	25	850
	Mercury	mg/kg	0.1	40					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1
	Nickel	mg/kg	5	400				175	6.5	<5	7.5	<5	7.9	7.4	<5	<5	<5	10
	Zinc	mg/kg	5	7400				522	150	44	330	400	75	90	24	28	34	260
PAH	1-Chloronaphthalene	mg/kg	0.5						<0.5	-	<0.5	-	-	-	-	-	<0.5	-
	3-methylcholanthrene	mg/kg	0.5						<0.5	-	<0.5	-	-	-	-	-	<0.5	-
	7,12-dimethylbenz(a)anthracene	mg/kg	0.5						<0.5	-	<0.5	-	-	-	-	-	<0.5	-
	Acenaphthene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Acenaphthylene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Anthracene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(a)anthracene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	1.3
	Benzo(a)pyrene	mg/kg	0.5				0.7		<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	1.4
	Benzo(a)pyrene TEQ (upper bound) *	mg/kg	0.5	3					1.2	1.2	1.2	1.2	1.4	1.2	1.2	1.2	1.2	2.4
	Benzo(g,h,i)perylene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.9
	Benzo(k)fluoranthene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8
	Chrysene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	1
	Benzo[b+j]fluoranthene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	1.6
	Dibenz(a,h)anthracene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Fluoranthene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	1.3	<0.5	<0.5	<0.5	<0.5	1.9
	Fluorene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7
	Naphthalene	mg/kg	0.5		3			170	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Phenanthrene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	0.7
	Pyrene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	1.3	<0.5	<0.5	<0.5	<0.5	1.9
	Total PAHs	mg/kg	0.5	300					<0.5	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	<0.5	12.2
Herbicides	Herbicides	mg/kg	0.5	LOR					<LOR	-	<LOR	-	-	-	-	-	<LOR	-
OCP	OCPs	mg/kg	0.05	LOR					<LOR	<LOR	<LOR	-	<LOR	-	<LOR	<LOR	<LOR	-
PAH/Phenols	Phenols	mg/kg	0.5	LOR					<LOR	-	<LOR	-	-	-	-	-	<LOR	-
Polychlorinated Biphenyls	PCBs (Sum of total)	mg/kg	0.5	1					<0.5	<0.5	-	-	-	-	-	-	<0.5	-
Solvents	Solvents	mg/kg	0.5	LOR					<LOR	-	<LOR	-	-	-	-	-	<LOR	-
SVOCs	SVOCs	mg/kg	0.5	LOR					<LOR	-	<LOR	-	-	-	-	-	<LOR	-
VHC	VHCs	mg/kg	0.5	LOR					<LOR	-	<LOR	-	-	-	-	-	<LOR	-
Asbestos	Asbestos	-	ND						-	ND	ND	-	-	-	-	ND	-	-

Table 1: Soil Analytical Results

Chem_Group	ChemName	Units	EQL	NEPM 2013 HILs Residential A Soil	NEPM 2013 Residential Soil HSL A/B for Vapour Intrusion, 0 to <1m, Sand	NEPM 2013 Mgmt Limits Residential, parkland and public open space, Coarse Soil	NEPM 2013 ESLs Urban residential and public open space, Coarse Soil	NEPM 2013 EIL Urban residential and open public spaces (Aged)	TP3 1.2-1.3	TP4 0.0-0.1	TP4 0.5-0.6	TP5-ACM	TP5 0.0-0.1	TP5 0.9-1.0	TP6-ACM	TP6 0.0-0.1	TP6 0.4-0.6	APS-1	TP7-ACM	TP7 0.0-0.1	TP7 0.9-1.0	TP8 0.0-0.1	TP8 0.4-0.6
								Sampled_Date-Time	23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017
								Matrix_Type	SOIL	SOIL	SOIL	Fibre Cement	SOIL	SOIL	Fibre Cement	SOIL	SOIL	Fibre Cement	Fibre Cement	SOIL	SOIL	SOIL	SOIL
TPH	F2-NAPHTHALENE	mg/kg	50		110				<50	<50	<50	-	<50	<50	-	<50	<50	-	-	<50	<50	<50	<50
	C6 - C9	mg/kg	20						<20	<20	<20	-	<20	<20	-	<20	<20	-	-	<20	<20	<20	<20
	C10 - C14	mg/kg	20						<20	<20	<20	-	<20	<20	-	<20	<20	-	-	<20	<20	<20	<20
	C15 - C28	mg/kg	50						<50	<50	<50	-	<50	<50	-	<50	<50	-	-	<50	<50	<50	<50
	C29 - C36	mg/kg	50						<50	<50	<50	-	52	<50	-	<50	52	-	-	<50	<50	<50	<50
	C10 - C36 (Sum of total)	mg/kg	50						<50	<50	<50	-	52	<50	-	<50	52	-	-	<50	<50	<50	<50
	C10-C16	mg/kg	50			1000	120		<50	<50	<50	-	<50	<50	-	<50	<50	-	-	<50	<50	<50	<50
	C16-C34	mg/kg	100			2500	300		<100	<100	<100	-	<100	<100	-	<100	<100	-	-	<100	<100	<100	<100
	C34-C40	mg/kg	100			10000	2800		<100	<100	<100	-	<100	<100	-	<100	<100	-	-	<100	<100	<100	<100
	C6 - C10	mg/kg	20			700	180		<20	<20	<20	-	<20	<20	-	<20	<20	-	-	<20	<20	<20	<20
BTEX	Benzene	mg/kg	0.1		0.5		50		<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1
	Ethylbenzene	mg/kg	0.1		55		70		<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1
	Toluene	mg/kg	0.1		160		85		<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1
	Xylene (m & p)	mg/kg	0.2						<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<0.2
	Xylene (o)	mg/kg	0.1						<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1
	Xylene Total	mg/kg	0.3		40		105		<0.3	<0.3	<0.3	-	<0.3	<0.3	-	<0.3	<0.3	-	-	<0.3	<0.3	<0.3	<0.3
	C6-C10 less BTEX (F1)	mg/kg	20		45				<20	<20	<20	-	<20	<20	-	<20	<20	-	-	<20	<20	<20	<20
Metals	Arsenic	mg/kg	2	100				100	9.2	2.8	13	-	3.4	3.2	-	2.1	9.8	-	-	2.4	4.3	2.4	<2
	Cadmium	mg/kg	0.4	20					<0.4	<0.4	<0.4	-	<0.4	<0.4	-	<0.4	<0.4	-	-	<0.4	<0.4	<0.4	<0.4
	Chromium	mg/kg	5	100				203	11	9.4	17	-	9.6	5.3	-	6.6	18	-	-	7.1	7	7.7	<5
	Copper	mg/kg	5	6000				308	5.4	21	49	-	25	23	-	6.2	54	-	-	8.9	30	7.3	17
	Lead	mg/kg	5	300				1100	26	41	130	-	81	99	-	12	79	-	-	12	75	14	34
	Mercury	mg/kg	0.1	40					<0.1	<0.1	0.1	-	<0.1	0.1	-	<0.1	<0.1	-	-	<0.1	0.1	<0.1	<0.1
	Nickel	mg/kg	5	400				175	<5	5.5	18	-	5.4	<5	-	<5	10	-	-	<5	<5	<5	7
	Zinc	mg/kg	5	7400				522	15	52	200	-	100	86	-	23	98	-	-	28	130	22	58
PAH	1-Chloronaphthalene	mg/kg	0.5						-	-	<0.5	-	-	-	-	-	-	-	-	<0.5	-	-	-
	3-methylcholanthrene	mg/kg	0.5						-	-	<0.5	-	-	-	-	-	-	-	-	<0.5	-	-	-
	7,12-dimethylbenz(a)anthracene	mg/kg	0.5						-	-	<0.5	-	-	-	-	-	-	-	-	<0.5	-	-	-
	Acenaphthene	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
	Acenaphthylene	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
	Anthracene	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
	Benzo(a)anthracene	mg/kg	0.5						<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	<0.5	0.9	<0.5	1.7
	Benzo(a)pyrene	mg/kg	0.5				0.7		<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	<0.5	1	<0.5	1.4
	Benzo(a)pyrene TEQ (upper bound) *	mg/kg	0.5	3					1.2	1.2	1.2	-	1.2	1.2	-	1.2	1.2	-	-	1.2	1.8	1.2	2.5
	Benzo(g,h,i)perylene	mg/kg	0.5						<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	<0.5	0.7	<0.5	1.2
	Benzo(k)fluoranthene	mg/kg	0.5						<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	<0.5	0.6	<0.5	0.9
	Chrysene	mg/kg	0.5						<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	<0.5	0.7	<0.5	1.4
	Benzo[b+j]fluoranthene	mg/kg	0.5						<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	<0.5	1.1	<0.5	1.9
	Dibenz(a,h)anthracene	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
	Fluoranthene	mg/kg	0.5						<0.5	<0.5	0.8	-	<0.5	0.6	-	<0.5	<0.5	-	-	<0.5	1.5	<0.5	4.3
	Fluorene	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
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5						<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	<0.5	0.5	<0.5	0.8
	Naphthalene	mg/kg	0.5		3			170	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5
	Phenanthrene	mg/kg	0.5						<0.5	<0.5	0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	<0.5	0.6	<0.5	1
	Pyrene	mg/kg	0.5						<0.5	<0.5	0.8	-	<0.5	0.7	-	<0.5	0.5	-	-	<0.5	1.5	<0.5	3.7
	Total PAHs	mg/kg	0.5	300					<0.5	<0.5	2.1	-	<0.5	1.3	-	<0.5	0.5	-	-	<0.5	9.1	<0.5	18.3
Herbicides	Herbicides	mg/kg	0.5	LOR					-	-	<LOR	-	-	-	-	-	-	-	-	<LOR	-	-	-
OCP	OCPs	mg/kg	0.05	LOR					-	<LOR	<LOR	-	<LOR	-	-	<LOR	-	-	-	<LOR	-	<LOR	-
PAH/Phenols	Phenols	mg/kg	0.5	LOR					-	-	<LOR	-	-	-	-	-	-	-	-	<LOR	-	-	-
Polychlorinated Biphenyls	PCBs (Sum of total)	mg/kg	0.5	1					-	-	<0.5	-	<0.5	-	-	<0.5	-	-	-	-	-	-	<0.5
Solvents	Solvents	mg/kg	0.5	LOR					-	-	<LOR	-	-	-	-	-	-	-	-	<LOR	-	-	-
SVOCs	SVOCs	mg/kg	0.5	LOR					-	-	<LOR	-	-	-	-	-	-	-	-	<LOR	-	-	-
VHC	VHCs	mg/kg	0.5	LOR					-	-	<LOR	-	-	-	-	-	-	-	-	<LOR	-	-	-
Asbestos	Asbestos	-	ND						-	-	ND	-	ND	ND	Chrysotile, amosite and crocidolite asbestos detected	-	-	Chrysotole asbestos detected	Chrysotile, amosite and crocidolite asbestos detected	ND	-	-	-

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Chem_Group	ChemName	Units	EQL	NEPM 2013 HILs Residential A Soil	NEPM 2013 Residential Soil HSL A/B for Vapour Intrusion, 0 to <1m, Sand	NEPM 2013 Mgmt Limits Residential, parkland and public open space, Coarse Soil	NEPM 2013 ESLs Urban residential and public open space, Coarse Soil	NEPM 2013 EIL Urban residential and open public spaces (Aged)	Hibbs & Associates Limited Sampling Investigation						
								Field_ID	S9179_BH01_1.2-1.3	S9179_BH02_0.8-0.9	S9179_BH03_0.3-0.4	S9179_BH03_0.7-0.8	S9179_BH04_1.5-1.6	S9179_BH05_1.4-1.5	S9179_101
								Sampled_Date-Time	12/07/2016	12/07/2016	12/07/2016	12/07/2016	12/07/2016	12/07/2016	12/07/2016
								Matrix_Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
TPH	F2-NAPHTHALENE	mg/kg	50		110				<50	<50	<50	<50	<50	<50	<51
	C6 - C9	mg/kg	20						-	-	-	-	-	-	-
	C10 - C14	mg/kg	20						-	-	-	-	-	-	-
	C15 - C28	mg/kg	50						-	-	-	-	-	-	-
	C29 - C36	mg/kg	50						-	-	-	-	-	-	-
	C10 - C36 (Sum of total)	mg/kg	50						-	-	-	-	-	-	-
	C10-C16	mg/kg	50			1000	120		<25	<25	<25	<25	<25	<25	<25
	C16-C34	mg/kg	100			2500	300		<100	<100	<100	<100	<100	<100	<100
	C34-C40	mg/kg	100			10000	2800		<100	<100	<100	<100	<100	<100	<100
	C6 - C10	mg/kg	20			700	180		<25	<25	<25	<25	<25	<25	<25
BTEX	Benzene	mg/kg	0.1		0.5		50		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Ethylbenzene	mg/kg	0.1		55		70		<1	<1	<1	<1	<1	<1	<1
	Toluene	mg/kg	0.1		160		85		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Xylene (m & p)	mg/kg	0.2						<2	<2	<2	<2	<2	<2	<2
	Xylene (o)	mg/kg	0.1						<1	<1	<1	<1	<1	<1	<1
	Xylene Total	mg/kg	0.3		40		105		<3	<3	<3	<3	<3	<3	<3
	C6-C10 less BTEX (F1)	mg/kg	20		45				<25	<25	<25	<25	<25	<25	<25
Metals	Arsenic	mg/kg	2	100				100	<4	<4	<4	8	<4	<4	<4
	Cadmium	mg/kg	0.4	20					1	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
	Chromium	mg/kg	5	100				203	16	9	9	10	<1	10	<1
	Copper	mg/kg	5	6000				308	130	21	22	11	<1	25	3
	Lead	mg/kg	5	300				1100	82	64	93	47	3	160	93
	Mercury	mg/kg	0.1	40					0.1	0.3	0.2	0.1	<0.1	1.3	<0.1
	Nickel	mg/kg	5	400				175	55	3	3	3	<1	5	<1
	Zinc	mg/kg	5	7400				522	290	160	94	50	4	92	24
PAH	1-Chloronaphthalene	mg/kg	0.5						-	-	-	-	-	-	-
	3-methylcholanthrene	mg/kg	0.5						-	-	-	-	-	-	-
	7,12-dimethylbenz(a)anthracene	mg/kg	0.5						-	-	-	-	-	-	-
	Acenaphthene	mg/kg	0.5						<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Acenaphthylene	mg/kg	0.5						<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1
	Anthracene	mg/kg	0.5						<0.1	<0.1	0.5	0.2	<0.1	0.1	<0.1
	Benzo(a)anthracene	mg/kg	0.5						0.2	0.1	0.8	0.4	<0.1	0.4	<0.1
	Benzo(a)pyrene	mg/kg	0.5				0.7		0.2	0.1	0.61	0.3	<0.05	0.3	<0.05
	Benzo(a)pyrene TEQ (upper bound) *	mg/kg	0.5	3					<0.5	<0.5	1	<0.5	<0.5	<0.5	<0.5
	Benzo(g,h,i)perylene	mg/kg	0.5						0.2	0.1	0.3	0.2	<0.1	0.2	<0.1
	Benzo(k)fluoranthene	mg/kg	0.5						-	-	-	-	-	-	-
	Chrysene	mg/kg	0.5						0.2	0.1	0.8	0.4	<0.1	0.4	<0.1
	Benzo[b+j]fluoranthene	mg/kg	0.5						-	-	-	-	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.5						<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1
	Fluoranthene	mg/kg	0.5						0.4	0.6	1.7	0.8	<0.1	0.8	<0.1
	Fluorene	mg/kg	0.5						<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5						0.1	<0.1	0.3	0.2	<0.1	0.2	<0.1
	Naphthalene	mg/kg	0.5		3			170	<1	<1	<1	<1	<1	<1	<1
	Phenanthrene	mg/kg	0.5						0.1	0.1	1.5	0.4	<0.1	0.5	<0.1
	Pyrene	mg/kg	0.5						0.4	0.6	1.5	0.8	<0.1	0.8	<0.1
	Total PAHs	mg/kg	0.5	300					2	1.5	9.6	4.3	ND	4.5	ND
Herbicides	Herbicides	mg/kg	0.5	LOR					-	-	-	-	-	-	-
OCP	OCPs	mg/kg	0.05	LOR					-	-	-	-	-	-	-
PAH/Phenols	Phenols	mg/kg	0.5	LOR					-	-	-	-	-	-	-
Polychlorinated Biphenyls	PCBs (Sum of total)	mg/kg	0.5	1					-	-	-	-	-	-	-
Solvents	Solvents	mg/kg	0.5	LOR					-	-	-	-	-	-	-
SVOCs	SVOCs	mg/kg	0.5	LOR					-	-	-	-	-	-	-
VHC	VHCs	mg/kg	0.5	LOR					-	-	-	-	-	-	-
Asbestos	Asbestos	-	ND						-	-	-	-	-	-	-

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Field Duplicates (SOIL)
Filter: ALL

			SDG **Field ID** **Sampled Date/Time**	27-Jan-17 TP5 0.9-1.0 23/01/2017	27-Jan-17 DUP 01 23/01/2017	**RPD**	27-Jan-17 TP3 0.4-0.6 23/01/2017	27-Jan-17 DUP 02 23/01/2017	**RPD**	27-Jan-17 TP3 0.4-0.6 23/01/2017	8241 DUP 02A 23/01/2017	**RPD**	27-Jan-17 HA01 0.0-0.1 24/01/2017	27-Jan-17 DUP 04 24/01/2017	**RPD**
Chem_Group	**ChemName**	**Units**	**EQL**												
BTEX	Benzene	mg/kg	0.1 (Primary): 0.2 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.2	0			
	Ethylbenzene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0			
	Toluene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0			
	Xylene (m & p)	mg/kg	0.2 (Primary): 0.5 (Interlab)	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.5	0			
	Xylene (o)	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0			
	Xylene Total	mg/kg	0.3 (Primary): 0.5 (Interlab)	<0.3	<0.3	0	<0.3	<0.3	0	<0.3	<0.5	0			
	C6-C10 less BTEX (F1)	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0
Inorganics	Moisture Content (dried @ 103°C)	%	1	16.0	10.0	46	9.2	14.0	41	9.2			3.9	4.7	19
Metals	Arsenic	mg/kg	2 (Primary): 5 (Interlab)	3.2	3.5	9	6.1	5.7	7	6.1	5.0	20	2.7	4.3	46
	Cadmium	mg/kg	0.4 (Primary): 1 (Interlab)	<0.4	<0.4	0	<0.4	<0.4	0	<0.4	<1.0	0	<0.4	<0.4	0
	Chromium	mg/kg	5 (Primary): 2 (Interlab)	5.3	6.8	25	12.0	12.0	0	12.0	8.0	40	12.0	8.7	32
	Copper	mg/kg	5	23.0	22.0	4	**230.0**	**38.0**	**143**	**230.0**	**65.0**	**112**	31.0	29.0	7
	Lead	mg/kg	5	99.0	91.0	8	**850.0**	**210.0**	**121**	850.0	552.0	43	74.0	86.0	15
	Mercury	mg/kg	0.1	0.1	<0.1	0	1.0	0.6	50	1.0	1.1	10	<0.1	<0.1	0
	Nickel	mg/kg	5 (Primary): 2 (Interlab)	<5.0	<5.0	0	10.0	5.5	58	10.0	7.0	35	6.5	5.9	10
	Zinc	mg/kg	5	86.0	94.0	9	260.0	170.0	42	260.0	277.0	6	150.0	120.0	22
PAH	Acenaphthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0			
	Acenaphthylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0			
	Anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0			
	Benzo(a)anthracene	mg/kg	0.5	<0.5	0.6	18	1.3	0.6	74	1.3	1.5	14			
	Benzo(a)pyrene	mg/kg	0.5	<0.5	<0.5	0	1.4	0.5	95	1.4	2.0	35			
	Benzo(a)pyrene TEQ (upper bound) *	mg/kg	0.5	1.2	1.2	0	2.4	1.2	67	2.4	3.1	25	1.2	1.2	0
	Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	<0.5	0	0.9	<0.5	57	0.9	1.5	50			
	Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	0.8	<0.5	46	0.8	0.9	12			
	Chrysene	mg/kg	0.5	<0.5	<0.5	0	1.0	<0.5	67	1.0	1.7	52			
	Benzo[b+j]fluoranthene	mg/kg	0.5	<0.5	0.6	18	1.6	0.6	91	1.6	2.1	27			
	Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0			
	Fluoranthene	mg/kg	0.5	0.6	0.8	29	1.9	0.9	71	1.9	3.0	45			
	Fluorene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0			
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	<0.5	<0.5	0	0.7	<0.5	33	0.7	1.2	53			
	Naphthalene	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0			
	Naphthalene	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Phenanthrene	mg/kg	0.5	<0.5	<0.5	0	0.7	<0.5	33	0.7	1.1	44			
	Pyrene	mg/kg	0.5	0.7	0.8	13	1.9	0.9	71	1.9	3.2	51			
	Total PAHs	mg/kg	0.5	1.3	2.8	73	**12.2**	**3.5**	**111**	12.2	18.2	39	<0.5	<0.5	0
TPH	F2-NAPHTHALENE	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
	C6 - C9	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0
	C10 - C14	mg/kg	20 (Primary): 50 (Interlab)	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<50.0	0	<20.0	<20.0	0
	C15 - C28	mg/kg	50 (Primary): 100 (Interlab)	<50.0	<50.0	0	78.0	<50.0	44	78.0	<100.0	0	<50.0	<50.0	0
	C29 - C36	mg/kg	50 (Primary): 100 (Interlab)	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<100.0	0	<50.0	<50.0	0
	C10 - C36 (Sum of total)	mg/kg	50	<50.0	<50.0	0	78.0	<50.0	44	78.0	<50.0	44	<50.0	<50.0	0
	C10-C16	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
	C16-C34	mg/kg	100	<100.0	<100.0	0	120.0	<100.0	18	120.0	<100.0	18	<100.0	<100.0	0
	C34-C40	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
	C6 - C10	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0

*RPDs have only been considered where a concentration is greater than 0 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 200 (0-10 x EQL); 50 (10-20 x EQL); 50 (> 20 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Chem_Group	ChemName	Units	EQL	CT1 NSW 2014 General Solid Waste (No Leaching)	CT2 NSW 2014 Restricted Solid Waste (No Leaching)	SCC1 NSW 2014 General Solid Waste (leached)	SCC2 NSW 2014 Restricted Solid Waste (leached)	HA01 0.0-0.1	HA02 0.0-0.1	HA04 0.0-0.1	HA04 0.8-1.0	HA05 0.0-0.1	HA05 0.4-0.5	HA06 0.0-0.1	HA07 0.0-0.1	TP3 0.0-0.1	TP3 0.4-0.6	TP3 1.2-1.3	TP4 0.0-0.1
							Field_ID	HA01 0.0-0.1	HA02 0.0-0.1	HA04 0.0-0.1	HA04 0.8-1.0	HA05 0.0-0.1	HA05 0.4-0.5	HA06 0.0-0.1	HA07 0.0-0.1	TP3 0.0-0.1	TP3 0.4-0.6	TP3 1.2-1.3	TP4 0.0-0.1
							Sampled_Date-Time	24/01/2017	24/01/2017	24/01/2017	24/01/2017	24/01/2017	24/01/2017	24/01/2017	24/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017
							Matrix_Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Amino Aliphatics, aromatics and	Amino Aliphatics, aromatics and anilines	mg/kg	0.5					<LOR	-	<LOR	-	-	-	-	-	<LOR	-	-	-
Anilines	2-nitroaniline	mg/kg	1					<1	-	<1	-	-	-	-	-	<1	-	-	-
	Aniline	mg/kg	0.5					<0.5	-	<0.5	-	-	-	-	-	<0.5	-	-	-
BTEX	Benzene	mg/kg	0.1	10	40	18	72	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Ethylbenzene	mg/kg	0.1	600	2400	1080	4320	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Toluene	mg/kg	0.1	288	1152	518	2073	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Xylene (m & p)	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Xylene (o)	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Xylene Total	mg/kg	0.3	1000	4000	1800	7200	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
	C6-C10 less BTEX (F1)	mg/kg	20					<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Chlorinated Hydrocarbons	Benzyl chloride	mg/kg	0.5					<0.5	-	<0.5	-	-	-	-	-	<0.5	-	-	-
	Hexachlorocyclopentadiene	mg/kg	1					<1	-	<1	-	-	-	-	-	<1	-	-	-
	Hexachloroethane	mg/kg	0.5					<0.5	-	<0.5	-	-	-	-	-	<0.5	3	-	-
Explosives	2,4-Dinitrotoluene	mg/kg	1	2.6	10.4	4.68	18.7	<1	-	<1	-	-	-	-	-	<1	-	-	-
	2,6-dinitrotoluene	mg/kg	1					<1	-	<1	-	-	-	-	-	<1	-	-	-
	Nitrobenzene	mg/kg	0.5	40	160	72	288	<0.5	-	<0.5	-	-	-	-	-	<0.5	-	-	-
Halogenated Benzenes	Halogenated Benzenes	mg/kg	0.5	10	40	18	72	<LOR	-	<LOR	-	-	-	-	-	<LOR	-	-	-
MAH	MAH	mg/kg	0.5					<LOR	-	<LOR	-	-	-	-	-	<LOR	-	-	-
Metals	Arsenic	mg/kg	2	100	400	500	2000	2.7	<2	<2	<2	2.8	2.1	<2	2.2	2.3	6.1	9.2	2.8
	Cadmium	mg/kg	0.4	20	80	100	400	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
	Chromium	mg/kg	5	100	400	1900	7600	12	8.5	12	7.8	10	8.6	<5	8.2	7.1	12	11	9.4
	Copper	mg/kg	5					31	14	37	34	21	32	<5	13	16	230	5.4	21
	Lead	mg/kg	5	100	400	1500	6000	74	28	81	110	60	48	<5	19	25	850	26	41
	TCLP Lead	mg/L	0.01			5	20	-	-	-	-	-	-	-	-	-	0.14	-	-
	Mercury	mg/kg	0.1	4	16	50	200	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1	<0.1	<0.1
	Nickel	mg/kg	5	40	160	1050	4200	6.5	<5	7.5	<5	7.9	7.4	<5	<5	<5	10	<5	5.5
	Zinc	mg/kg	5					150	44	330	400	75	90	24	28	34	260	15	52
Nitroaromatics	2-Picoline	mg/kg	0.5					<0.5	-	<0.5	-	-	-	-	-	<0.5	-	-	-
	4-aminobiphenyl	mg/kg	0.5					<0.5	-	<0.5	-	-	-	-	-	<0.5	-	-	-
	Pentachloronitrobenzene	mg/kg	0.5					<0.5	-	<0.5	-	-	-	-	-	<0.5	-	-	-
OCP	OCP	mg/kg	0.05					<LOR	<LOR	<LOR	-	<LOR	-	<LOR	<LOR	<LOR	-	-	<LOR
PAH	1-Chloronaphthalene	mg/kg	0.5					<0.5	-	<0.5	-	-	-	-	-	<0.5	-	-	-
	3-methylcholanthrene	mg/kg	0.5					<0.5	-	<0.5	-	-	-	-	-	<0.5	-	-	-
	7,12-dimethylbenz(a)anthracene	mg/kg	0.5					<0.5	-	<0.5	-	-	-	-	-	<0.5	-	-	-
	Acenaphthene	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	<0.5
	Acenaphthylene	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	<0.5
	Anthracene	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	<0.5
	Benzo(a)anthracene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	1.3	<0.5	<0.5
	Benzo(a)pyrene	mg/kg	0.5	0.8	3.2	10	23	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	1.4	<0.5	<0.5
	TCLP B(a)P	mg/L	0.001			0.04	0.16	-	-	-	-	-	-	-	-	-	<0.001	-	-
	Benzo(a)pyrene TEQ (upper bound) *	mg/kg	0.5					1.2	1.2	1.2	1.2	1.4	1.2	1.2	1.2	1.2	2.4	1.2	1.2
	Benzo(g,h,i)perylene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.9	<0.5	<0.5
	Benzo(k)fluoranthene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5
	Chrysene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	1	<0.5	<0.5
	Benzo[b+j]fluoranthene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	1.6	<0.5	<0.5
	Dibenz(a,h)anthracene	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	<0.5
	Fluoranthene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	1.3	<0.5	<0.5	<0.5	<0.5	1.9	<0.5	<0.5
	Fluorene	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	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5
	Naphthalene	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	<0.5
	Phenanthrene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5
	Pyrene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	1.3	<0.5	<0.5	<0.5	<0.5	1.9	<0.5	<0.5
	Total PAHs	mg/kg	0.5	200	800	200	800	<0.5	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	<0.5	12.2	<0.5	<0.5
Phthalates/Phenols	2-chloronaphthalene	mg/kg	0.5					<LOR	-	<LOR	-	-	-	-	-	<LOR	-	-	-
Polychlorinated Biphenyls	PCBs	mg/kg	0.1					<LOR	<LOR	-	-	-	-	-	-	<LOR	-	-	-
Solvents	Solvents	mg/kg	0.5	4000	16000	7200	28800	<LOR	-	<LOR	-	-	-	-	-	<LOR	-	-	-
SVOCs	SVOCs	mg/kg	0.5					<LOR	-	<LOR	-	-	-	-	-	<LOR	-	-	-
TPH	F2-NAPHTHALENE	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	<50
	C6 - C9	mg/kg	20	650	2600	650	2600	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C10 - C14	mg/kg	20					<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	<20
	C15 - C28	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50	<50	78	-	<50
	C29 - C36	mg/kg	50					<50	<50	52	<50	<50	<50	<50	<50	<50	<50	-	<50
	C10 - C36 (Sum of total)	mg/kg	50	10000	40000	10000	40000	<50	<50	52	<50	<50	<50	<50	<50	<50	78	<0	<50
	C10-C16	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	<50
	C16-C34	mg/kg	100					<100	<100	<100	<100	<100	<100	<100	<100	<100	120	-	<100
	C34-C40	mg/kg	100					<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	-	<100
	C6 - C10	mg/kg	20					<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
VHC	VHCs	mg/kg	0.5	200	800	360	1440	<LOR	-	<LOR	-	-	-	-	-	<LOR	-	-	-
Asbestos	Asbestos	-	ND					-	ND	ND	-	-	-	-	ND	-	-	-	-

Chem_Group	ChemName	Units	EQL	CT1 NSW 2014 General Solid Waste (No Leaching)	CT2 NSW 2014 Restricted Solid Waste (No Leaching)	SCC1 NSW 2014 General Solid Waste (leached)	SCC2 NSW 2014 Restricted Solid Waste (leached)	TP4 0.5-0.6	TP5-ACM	TP5 0.0-0.1	TP5 0.9-1.0	TP6-ACM	TP6 0.0-0.1	TP6 0.4-0.6	APS-1	TP7-ACM	TP7 0.0-0.1	TP7 0.9-1.0	TP8 0.0-0.1	TP8 0.4-0.6
							Sampled_Date-Time	23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017	23/01/2017
							Matrix_Type	SOIL	Fibre Cement	SOIL	SOIL	Fibre Cement	SOIL	SOIL	Fibre Cement	Fibre Cement	SOIL	SOIL	SOIL	SOIL
Amino Aliphatics, aromatics and	Amino Aliphatics, aromatics and anilines	mg/kg	0.5					<LOR	-	-	-	-	-	-	-	-	<LOR	-	-	-
Anilines	2-nitroaniline	mg/kg	1					<1	-	-	-	-	-	-	-	-	<1	-	-	-
	Aniline	mg/kg	0.5					<0.5	-	-	-	-	-	-	-	-	<0.5	-	-	-
BTEX	Benzene	mg/kg	0.1	10	40	18	72	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1
	Ethylbenzene	mg/kg	0.1	600	2400	1080	4320	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1
	Toluene	mg/kg	0.1	288	1152	518	2073	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1
	Xylene (m & p)	mg/kg	0.2					<0.2	-	<0.2	<0.2	-	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<0.2
	Xylene (o)	mg/kg	0.1					<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1
	Xylene Total	mg/kg	0.3	1000	4000	1800	7200	<0.3	-	<0.3	<0.3	-	<0.3	<0.3	-	-	<0.3	<0.3	<0.3	<0.3
	C6-C10 less BTEX (F1)	mg/kg	20					<20	-	<20	<20	-	<20	<20	-	-	<20	<20	<20	<20
Chlorinated Hydrocarbons	Benzyl chloride	mg/kg	0.5					<0.5	-	-	-	-	-	-	-	-	<0.5	-	-	-
	Hexachlorocyclopentadiene	mg/kg	1					<1	-	-	-	-	-	-	-	-	<1	-	-	-
	Hexachloroethane	mg/kg	0.5					<0.5	-	-	-	-	-	-	-	-	<0.5	-	-	-
Explosives	2,4-Dinitrotoluene	mg/kg	1	2.6	10.4	4.68	18.7	<1	-	-	-	-	-	-	-	-	<1	-	-	-
	2,6-dinitrotoluene	mg/kg	1					<1	-	-	-	-	-	-	-	-	<1	-	-	-
	Nitrobenzene	mg/kg	0.5	40	160	72	288	<0.5	-	-	-	-	-	-	-	-	<0.5	-	-	-
Halogenated Benzenes	Halogenated Benzenes	mg/kg	0.5	10	40	18	72	<LOR	-	-	-	-	-	-	-	-	<LOR	-	-	-
MAH	MAH	mg/kg	0.5					<LOR		-	-	-	-	-	-	-	<LOR	-	-	-
Metals	Arsenic	mg/kg	2	100	400	500	2000	13	-	3.4	3.2	-	2.1	9.8	-	-	2.4	4.3	2.4	<2
	Cadmium	mg/kg	0.4	20	80	100	400	<0.4	-	<0.4	<0.4	-	<0.4	<0.4	-	-	<0.4	<0.4	<0.4	<0.4
	Chromium	mg/kg	5	100	400	1900	7600	17	-	9.6	5.3	-	6.6	18	-	-	7.1	7	7.7	<5
	Copper	mg/kg	5					49	-	25	23	-	6.2	54	-	-	8.9	30	7.3	17
	Lead	mg/kg	5	100	400	1500	6000	130	-	81	99	-	12	79	-	-	12	75	14	34
	TCLP Lead	mg/L	0.01			5	20	<0.01	-	-	-	-	-	-	-	-	-	-	-	<0.01
	Mercury	mg/kg	0.1	4	16	50	200	0.1	-	<0.1	0.1	-	<0.1	<0.1	-	-	<0.1	0.1	<0.1	<0.1
	Nickel	mg/kg	5	40	160	1050	4200	18	-	5.4	<5	-	<5	10	-	-	<5	<5	<5	7
	Zinc	mg/kg	5					200	-	100	86	-	23	98	-	-	28	130	22	58
Nitroaromatics	2-Picoline	mg/kg	0.5					<0.5	-	-	-	-	-	-	-	-	<0.5	-	-	-
	4-aminobiphenyl	mg/kg	0.5					<0.5	-	-	-	-	-	-	-	-	<0.5	-	-	-
	Pentachloronitrobenzene	mg/kg	0.5					<0.5	-	-	-	-	-	-	-	-	<0.5	-	-	-
OCP	OCP	mg/kg	0.05					<LOR	-	<LOR	-	-	<LOR	-	-	-	<LOR	-	<LOR	-
PAH	1-Chloronaphthalene	mg/kg	0.5					<0.5	-	-	-	-	-	-	-	-	<0.5	-	-	-
	3-methylcholanthrene	mg/kg	0.5					<0.5	-	-	-	-	-	-	-	-	<0.5	-	-	-
	7,12-dimethylbenz(a)anthracene	mg/kg	0.5					<0.5	-	-	-	-	-	-	-	-	<0.5	-	-	-
	Acenaphthene	mg/kg	0.5					<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5
	Acenaphthylene	mg/kg	0.5					<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5
	Anthracene	mg/kg	0.5					<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5
	Benzo(a)anthracene	mg/kg	0.5					<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	<0.5	0.9	<0.5	1.7
	Benzo(a)pyrene	mg/kg	0.5	0.8	3.2	10	23	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	<0.5	1	<0.5	1.4
	TCLP B(a)P	mg/L	0.001			0.04	0.16	-	-	-	-	-	-	-	-	-	-	-	-	<0.001
	Benzo(a)pyrene TEQ (upper bound) *	mg/kg	0.5					1.2	-	1.2	1.2	-	1.2	1.2	-	-	1.2	1.8	1.2	2.5
	Benzo(g,h,i)perylene	mg/kg	0.5					<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	<0.5	0.7	<0.5	1.2
	Benzo(k)fluoranthene	mg/kg	0.5					<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	<0.5	0.6	<0.5	0.9
	Chrysene	mg/kg	0.5					<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	<0.5	0.7	<0.5	1.4
	Benzo[b+j]fluoranthene	mg/kg	0.5					<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	<0.5	1.1	<0.5	1.9
	Dibenz(a,h)anthracene	mg/kg	0.5					<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5
	Fluoranthene	mg/kg	0.5					0.8	-	<0.5	0.6	-	<0.5	<0.5	-	-	<0.5	1.5	<0.5	4.3
	Fluorene	mg/kg	0.5					<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5					<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	<0.5	0.5	<0.5	0.8
	Naphthalene	mg/kg	0.5					<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5
	Phenanthrene	mg/kg	0.5					0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-	<0.5	0.6	<0.5	1
	Pyrene	mg/kg	0.5					0.8	-	<0.5	0.7	-	<0.5	0.5	-	-	<0.5	1.5	<0.5	3.7
	Total PAHs	mg/kg	0.5	200	800	200	800	2.1	-	<0.5	1.3	-	<0.5	0.5	-	-	<0.5	9.1	<0.5	18.3
Phthalates/Phenols	2-chloronaphthalene	mg/kg	0.5					<LOR	-	-	-	-	-	-	-	-	<LOR	-	-	-
Polychlorinated Biphenyls	PCBs	mg/kg	0.1					<LOR	-	<LOR	-	-	<LOR	-	-	-	-	-	-	<LOR
Solvents	Solvents	mg/kg	0.5	4000	16000	7200	28800	<LOR	-	-	-	-	-	-	-	-	<LOR	-	-	-
SVOCs	SVOCs	mg/kg	0.5					<LOR	-	-	-	-	-	-	-	-	<LOR	-	-	-
TPH	F2-NAPHTHALENE	mg/kg	50					<50	-	<50	<50	-	<50	<50	-	-	<50	<50	<50	<50
	C6 - C9	mg/kg	20	650	2600	650	2600	<20	-	<20	<20	-	<20	<20	-	-	<20	<20	<20	<20
	C10 - C14	mg/kg	20					<20	-	<20	<20	-	<20	<20	-	-	<20	<20	<20	<20
	C15 - C28	mg/kg	50					<50	-	<50	<50	-	<50	<50	-	-	<50	<50	<50	<50
	C29 - C36	mg/kg	50					<50	-	52	<50	-	<50	52	-	-	<50	<50	<50	<50
	C10 - C36 (Sum of total)	mg/kg	50	10000	40000	10000	40000	<50	-	52	<50	-	<50	52	-	-	<50	<50	<50	<50
	C10-C16	mg/kg	50					<50	-	<50	<50	-	<50	<50	-	-	<50	<50	<50	<50
	C16-C34	mg/kg	100					<100	-	<100	<100	-	<100	<100	-	-	<100	<100	<100	<100
	C34-C40	mg/kg	100					<100	-	<100	<100	-	<100	<100	-	-	<100	<100	<100	<100
	C6 - C10	mg/kg	20					<20	-	<20	<20	-	<20	<20	-	-	<20	<20	<20	<20
VHC	VHCs	mg/kg	0.5	200	800	360	1440	<LOR	-	-	-	-	-	-	-	-	<LOR	-	-	-
Asbestos	Asbestos	-	ND					ND	-	ND	ND	Chrysotile, amosite and crocidolite	-	-	Chrysotole asbestos detected	Chrysotile, amosite and crocidolite	ND	-	-	-

Table 4: Quality Control Sample Results

TKD Architects Pty Ltd / Alexandria Park Community School

Filter: ALL
Field Blanks (WATER)

			SDG	27-Jan-17	27-Jan-17	27-Jan-17	27-Jan-17	27-Jan-17
			Field ID	RINSATE	TB1	TB2	TS1	TS2
			Sampled_Date/Time	24/01/2017	23/01/2017	24/01/2017	23/01/2017	24/01/2017
			Sample Type	Rinsate	Trip_B	Trip_B	Trip_S	Trip_S
Chem_Group	**ChemName**	**Units**	**EQL**					
BTEX	Benzene	µg/l	1	<1	<1	<1	112%	109%
	Ethylbenzene	µg/l	1	<1	<1	<1	98%	98%
	Toluene	µg/l	1	<1	<1	<1	107%	104%
	Xylene (m & p)	µg/l	2	<2	<2	<2	100%	100%
	Xylene (o)	µg/l	1	<1	<1	<1	102%	101%
	Xylene Total	µg/l	3	<3	<3	<3	101%	100%
	C6-C10 less BTEX (F1)	mg/l	0.02	<0.02	-	-	-	-
Metals	Arsenic	mg/l	0.001	<0.001	-	-	-	-
	Cadmium	mg/l	0.0002	<0.0002	-	-	-	-
	Chromium	mg/l	0.001	<0.001	-	-	-	-
	Copper	mg/l	0.001	<0.001	-	-	-	-
	Lead	mg/l	0.001	<0.001	-	-	-	-
	Mercury	mg/l	0.0001	<0.0001	-	-	-	-
	Nickel	mg/l	0.001	<0.001	-	-	-	-
	Zinc	mg/l	0.005	**0.005**	-	-	-	-
PAH	Acenaphthene	µg/l	1	<1	-	-	-	-
	Acenaphthylene	µg/l	1	<1	-	-	-	-
	Anthracene	µg/l	1	<1	-	-	-	-
	Benzo(a)anthracene	µg/l	1	<1	-	-	-	-
	Benzo(a)pyrene	µg/l	1	<1	-	-	-	-
	Benzo(g,h,i)perylene	µg/l	1	<1	-	-	-	-
	Benzo(k)fluoranthene	µg/l	1	<1	-	-	-	-
	Chrysene	µg/l	1	<1	-	-	-	-
	Benzo[b+j]fluoranthene	mg/l	0.001	<0.001	-	-	-	-
	Dibenz(a,h)anthracene	µg/l	1	<1	-	-	-	-
	Fluoranthene	µg/l	1	<1	-	-	-	-
	Fluorene	µg/l	1	<1	-	-	-	-
	Indeno(1,2,3-c,d)pyrene	µg/l	1	<1	-	-	-	-
	Naphthalene	µg/l	1	<10	-	-	-	-
	Phenanthrene	µg/l	1	<1	-	-	-	-
	Pyrene	µg/l	1	<1	-	-	-	-
	Total PAHs	µg/l	1	<1	-	-	-	-
TPH	F2-NAPHTHALENE	mg/l	0.05	<0.05	-	-	-	-
	C6 - C9	µg/l	20	<20	<20	<20	96%	95%
	C10 - C14	µg/l	50	<50	-	-	-	-
	C15 - C28	µg/l	100	<100	-	-	-	-
	C29 - C36	µg/l	100	<100	-	-	-	-
	C10 - C36 (Sum of total)	µg/l	100	<100	-	-	-	-
	C10-C16	mg/l	0.05	<0.05	-	-	-	-
	C16-C34	mg/l	0.1	<0.1	-	-	-	-
	C34-C40	mg/l	0.1	<0.1	-	-	-	-
	C6 - C10	mg/l	0.02	<0.02	-	-	-	-

Chem_Group	ChemName	Units	EQL	ANZECC 2000 Marine 95%	NEPM 2013 GILs, Fresh Waters(A)	NEPM 2013 Residential GW HSL A/B Vapour Intrusion, 2m to <4m, Sand	MW1	MW2	MW3
						Field_ID	MW1	MW2	MW3
						Sampled_Date-Time	19/04/2017	19/04/2017	19/04/2017
						Matrix_Type	WATER	WATER	WATER
						Lab_Report_Number	542888	542888	542888
Amino Aliphatics	N-nitrosodi-n-butylamine	µg/L	2				<2	<2	<2
	N-nitrosodi-n-propylamine	µg/L	2				<2	<2	<2
Amino Aromatics	1-naphthylamine	µg/L	2				<2	<2	<2
	2-naphthylamine	µg/L	2				<2	<2	<2
	Diphenylamine	µg/L	2				<2	<2	<2
Anilines	2-nitroaniline	µg/L	4				<4	<4	<4
	Aniline	µg/L	2		8		<2	<2	<2
BTEX	Benzene	µg/L	1	700	950	800	<1	<1	<1
	Ethylbenzene	µg/L	1	1			<1	<1	<1
	Toluene	µg/L	1	1			<1	<1	<1
	Xylene (m & p)	µg/L	2	2			<2	<2	<2
	Xylene (o)	µg/L	1	1	350		<1	<1	<1
	Xylene Total	µg/L	3				<3	<3	<3
	C6-C10 less BTEX (F1)	mg/L	0.02			1	<0.02	0.12	<0.02
Chlorinated Hydrocarbons	Benzyl chloride	mg/L	0.001				<0.001	<0.001	<0.001
	Hexachlorocyclopentadiene	µg/L	4				<4	<4	<4
	Hexachloroethane	µg/L	2		290		<2	<2	<2
Explosives	2,4-Dinitrotoluene	µg/L	4				<4	<4	<4
	2,6-dinitrotoluene	µg/L	4				<4	<4	<4
	Nitrobenzene	µg/L	2				<2	<2	<2
Halogenated Benzenes	1,2,3,4-tetrachlorobenzene	mg/L	0.001				<0.001	<0.001	<0.001
	1,2,3,5-Tetrachlorobenzene	mg/L	0.001				<0.001	<0.001	<0.001
	1,2,4,5-tetrachlorobenzene	µg/L	2				<2	<2	<2
	1,3,5-Trichlorobenzene	µg/L	1				<1	<1	<1
	Pentachlorobenzene	µg/L	2				<2	<2	<2
Herbicides	Pronamide	µg/L	1				<1	<1	<1
	Trifluralin	mg/L	0.001		0.0026		<0.001	<0.001	<0.001
Inorganics	Ammonia as N	µg/L	10	910	900		50	30	80
	Nitrate (as N)	mg/L	0.02	700			2.1	<0.02	5.7
Ions	Potassium	mg/L	0.5				9	23	7.6
MAH	1,2,4-trimethylbenzene	µg/L	1				<1	<1	<1
	1,3,5-trimethylbenzene	µg/L	1				<1	<1	<1
	Isopropylbenzene	µg/L	1				<1	<1	<1
	Styrene	µg/L	1				<1	<1	<1
Metals	Antimony	mg/L	0.005				0.047	<0.005	<0.005
	Arsenic (Filtered)	mg/L	0.001	0.001			<0.001	<0.001	<0.001
	Cadmium (Filtered)	mg/L	0.0002	0.0055	0.0002		<0.0002	<0.0002	<0.0002
	Chromium (Filtered)	mg/L	0.001				0.001	0.001	<0.001
	Copper (Filtered)	mg/L	0.001	0.0013	0.0014		0.002	0.008	0.002
	Lead (Filtered)	mg/L	0.001	0.0044	0.0034		<0.001	0.001	<0.001
	Mercury (Filtered)	mg/L	0.0001	0.0004	0.00006		<0.0001	<0.0001	<0.0001
	Nickel (Filtered)	mg/L	0.001	0.07	0.011		0.001	0.001	<0.001
	Zinc (Filtered)	mg/L	0.005	0.015	0.008		<0.005	0.006	<0.005
Nitroaromatics	2-Picoline	µg/L	1				<1	<1	<1
	4-aminobiphenyl	µg/L	2				<2	<2	<2
	Pentachloronitrobenzene	µg/L	2				<2	<2	<2
OCP	4,4-DDE	µg/L	2				<2	<2	<2
	a-BHC	µg/L	2				<2	<2	<2
	Aldrin	µg/L	2				<2	<2	<2
	b-BHC	µg/L	2				<2	<2	<2
	d-BHC	µg/L	2				<2	<2	<2
	DDD	µg/L	2				<2	<2	<2
	DDT	µg/L	4		0.006		<4	<4	<4
	Dieldrin	µg/L	2				<2	<2	<2
	Endosulfan I	µg/L	2				<2	<2	<2
	Endosulfan II	µg/L	2				<2	<2	<2
	Endosulfan sulphate	µg/L	2				<2	<2	<2
	Endrin	µg/L	2	0.008	0.01		<2	<2	<2
	Endrin aldehyde	µg/L	2				<2	<2	<2
	Endrin ketone	µg/L	2				<2	<2	<2
	g-BHC (Lindane)	µg/L	2		0.2		<2	<2	<2
	Heptachlor	µg/L	2		0.01		<2	<2	<2
	Heptachlor epoxide	µg/L	2				<2	<2	<2
	Hexachlorobenzene	µg/L	2				<2	<2	<2
	Methoxychlor	µg/L	1				<1	<1	<1
PAH	1-Chloronaphthalene	µg/L	5				<5	<5	<5
	3-methylcholanthrene	µg/L	2				<2	<2	<2
	7,12-dimethylbenz(a)anthracene	µg/L	2				<2	<2	<2
	Acenaphthene	µg/L	1				<1	<1	<1
	Acenaphthylene	µg/L	1				<1	<1	<1
	Anthracene	µg/L	1	1			<1	<1	<1
	Benzo(a)anthracene	µg/L	1				<1	<1	<1
	Benzo(a)pyrene	µg/L	1	1			<1	<1	<1
	Benzo(g,h,i)perylene	µg/L	1				<1	<1	<1
	Benzo(k)fluoranthene	µg/L	1				<1	<1	<1
	Chrysene	µg/L	1				<1	<1	<1
	Benzo[b+j]fluoranthene	mg/L	0.001				<0.001	<0.001	<0.001
	Dibenz(a,h)anthracene	µg/L	1				<1	<1	<1
	Fluoranthene	µg/L	1	1			<1	<1	<1
	Fluorene	µg/L	1				<1	<1	<1
	Indeno(1,2,3-c,d)pyrene	µg/L	1				<1	<1	<1
	Naphthalene	µg/L	1	70	16		<1	<1	<1
	Phenanthrene	µg/L	1	1			<1	<1	<1
	Pyrene	µg/L	1				<1	<1	<1
PAH/Phenols	2-chloronaphthalene	µg/L	2				<2	<2	<2
	2-methylnaphthalene	µg/L	2				<2	<2	<2
	Acetophenone	µg/L	2				<2	<2	<2
Phenol	2,3,4,6-tetrachlorophenol	µg/L	2		10		<2	<2	<2
	2,4,5-trichlorophenol	µg/L	1				<1	<1	<1
	2,4,6-trichlorophenol	µg/L	10		3		<10	<10	<10
	2,4-dichlorophenol	µg/L	1		120		<1	<1	<1
	2,4-dimethylphenol	µg/L	1				<1	<1	<1
	2,4-dinitrophenol	mg/L	0.001		0.045		<0.001	<0.001	<0.001
	2,6-dichlorophenol	µg/L	3				<3	<3	<3
	2-chlorophenol	µg/L	3		340		<3	<3	<3
	2-methylphenol	µg/L	3				<3	<3	<3
	2-nitrophenol	µg/L	5				<5	<5	<5
	3-&4-methylphenol	µg/L	6				<6	<6	<6
	4,6-Dinitro-2-methylphenol	µg/L	5				<5	<5	<5
	4-chloro-3-methylphenol	µg/L	10				<10	<10	<10
	4-nitrophenol	µg/L	1				<1	<1	<1
	Pentachlorophenol	µg/L	10	22	3.6		<10	<10	<10
	Phenol	µg/L	3	400	320		<3	<3	<3

						Field_ID	MW1	MW2	MW3
						Sampled_Date-Time	19/04/2017	19/04/2017	19/04/2017
						Matrix_Type	WATER	WATER	WATER
						Lab_Report_Number	542888	542888	542888
				ANZECC 2000 Marine 95%	NEPM 2013 GILs, Fresh Waters(A)	NEPM 2013 Residential GW HSL A/B Vapour Intrusion, 2m to <4m, Sand			
Chem_Group	ChemName	Units	EQL						
Phthalates	Bis(2-ethylhexyl) phthalate	µg/L	20				<20	<20	<20
	Butyl benzyl phthalate	µg/L	2				<2	<2	<2
	Diethylphthalate	µg/L	2		1000		<2	<2	<2
	Dimethyl phthalate	µg/L	2		3700		<2	<2	<2
	Di-n-butyl phthalate	µg/L	2		10		<2	<2	<2
	Di-n-octyl phthalate	µg/L	2				<2	<2	<2
Solvents	Methyl Ethyl Ketone	µg/L	1	1			<1	<1	<1
	4-Methyl-2-pentanone	µg/L	1	1			<1	<1	<1
	Acetone	mg/L	0.001	0.001			<0.001	<0.001	<0.001
	Allyl chloride	mg/L	0.001	0.001			<0.001	<0.001	<0.001
	Carbon disulfide	µg/L	1	1			<1	<1	<1
SVOCs	3,3-Dichlorobenzidine	µg/L	1	1			<1	<1	<1
	4-(dimethylamino) azobenzene	µg/L	2	2			<2	<2	<2
	4-bromophenyl phenyl ether	µg/L	2	2			<2	<2	<2
	4-chlorophenyl phenyl ether	µg/L	2	2			<2	<2	<2
	Bis(2-chloroethoxy) methane	µg/L	2	2			<2	<2	<2
	Bis(2-chloroisopropyl) ether	µg/L	2	2			<2	<2	<2
	Dibenz(a.j)acridine	mg/L	0.001	0.001			<0.001	<0.001	<0.001
	Dibenzofuran	µg/L	2	2			<2	<2	<2
	N-nitrosopiperidine	µg/L	2	2			<2	<2	<2
TPH	F2-NAPHTHALENE	mg/L	0.05	0.05		1	<0.05	<0.05	<0.05
	C6 - C9	µg/L	20				<20	120	<20
	C10 - C14	µg/L	50				<50	<50	<50
	C15 - C28	µg/L	100				<100	<100	<100
	C29 - C36	µg/L	100				<100	<100	<100
	C10 - C36 (Sum of total)	µg/L	100				<100	<100	<100
	C10-C16	mg/L	0.05	0.05			<0.05	<0.05	<0.05
	C16-C34	mg/L	0.1	0.1			<0.1	<0.1	<0.1
	C34-C40	mg/L	0.1	0.1			<0.1	<0.1	<0.1
	C6 - C10	mg/L	0.02	0.02			<0.02	0.12	<0.02
VHC	1,1,1,2-tetrachloroethane	µg/L	1	1			<1	<1	<1
	1,1,1-trichloroethane	µg/L	1	1			<1	<1	<1
	1,1,2,2-tetrachloroethane	µg/L	1	1			<1	<1	<1
	1,1,2-trichloroethane	µg/L	1	1900	6500		<1	<1	<1
	1,1-dichloroethane	µg/L	1	1			<1	<1	<1
	1,1-dichloroethene	µg/L	1	1			<1	<1	<1
	1,2,3-trichlorobenzene	µg/L	1	1	3		<1	<1	<1
	1,2,3-trichloropropane	µg/L	1	1			<1	<1	<1
	1,2,4-trichlorobenzene	µg/L	2	80	85		<2	<2	<2
	1,2-dibromoethane	µg/L	1	1			<1	<1	<1
	1,2-dichlorobenzene	µg/L	1	1	160		<1	<1	<1
	1,2-dichloroethane	µg/L	1	1			<1	<1	<1
	1,2-dichloropropane	µg/L	1	1			<1	<1	<1
	1,3-dichlorobenzene	µg/L	1	1	260		<1	<1	<1
	1,3-dichloropropane	µg/L	1	1			<1	<1	<1
	1,4-dichlorobenzene	µg/L	1	1	60		<1	<1	<1
	4-chlorotoluene	µg/L	1	1			<1	<1	<1
	Bromobenzene	µg/L	1	1			<1	<1	<1
	Bromochloromethane	µg/L	1	1			<1	<1	<1
	Bromodichloromethane	µg/L	1	1			<1	<1	<1
	Bromoform	µg/L	1	1			<1	<1	<1
	Bromomethane	µg/L	1	1			<1	<1	<1
	Carbon tetrachloride	µg/L	1	1			<1	<1	<1
	Chlorobenzene	µg/L	1	1			<1	<1	<1
	Chlorodibromomethane	µg/L	1	1			<1	<1	<1
	Chloroethane	µg/L	1	1			<1	<1	<1
	Chloroform	µg/L	5	5			<5	<5	<5
	Chloromethane	µg/L	1	1			<1	<1	<1
	cis-1,2-dichloroethene	µg/L	1	700	700	1	<1	21	<1
	cis-1,3-dichloropropene	µg/L	1	1			<1	<1	<1
	Dibromomethane	µg/L	1	1			<1	<1	<1
	Dichlorodifluoromethane	µg/L	1	1			<1	<1	<1
	Dichloromethane	µg/L	1	1			<1	<1	<1
	Hexachlorobutadiene	µg/L	2	2			<2	<2	<2
	Iodomethane	µg/L	1	1			<1	<1	<1
	Trichloroethene	µg/L	1	330	330	1	<1	14	<1
	Tetrachloroethene	µg/L	1	70	70	1	<1	51	1
	trans-1,2-dichloroethene	µg/L	1	1			<1	<1	<1
	trans-1,3-dichloropropene	µg/L	1	1			<1	<1	<1
	Trichlorofluoromethane	µg/L	1	1			<1	<1	<1
	Vinyl chloride	µg/L	1	100	100	1	<1	6	<1
Perchlorate	Perchlorate	mg/L	0.02	0.02			<0.02	<0.02	<0.02
Picric Acid	2,4,6 - Trinitrophenol	µg/L	0.5	250			<0.5	<0.5	<0.5

Field Duplicates (WATER)
Filter: Lab_Report_Number in('542888')

Chem_Group	ChemName	Units	EQL	542888	542888	RPD
			Lab Report Number	542888	542888	
			Field ID	MW3	DUP01	RPD
			Sampled Date/Time	19/04/2017	19/04/2017	
BTEX	C6-C10 less BTEX (F1)	mg/l	0.02	<0.02	<0.02	0
Inorganics	Ammonia as N	µg/l	10	80.0	80.0	0
	Nitrate (as N)	mg/l	0.02	5.7	5.9	3
Metals	Antimony	mg/l	0.005	<0.005	<0.005	0
	Arsenic (Filtered)	mg/l	0.001	<0.001	<0.001	0
	Cadmium (Filtered)	mg/l	0.0002	<0.0002	<0.0002	0
	Chromium (Filtered)	mg/l	0.001	<0.001	0.002	67
	Copper (Filtered)	mg/l	0.001	0.002	0.002	0
	Lead (Filtered)	mg/l	0.001	<0.001	<0.001	0
	Mercury (Filtered)	mg/l	0.0001	<0.0001	<0.0001	0
	Nickel (Filtered)	mg/l	0.001	<0.001	<0.001	0
	Zinc (Filtered)	mg/l	0.005	<0.005	0.005	0
PAH	Naphthalene	µg/l	10	<10.0	<10.0	0
TPH	F2-NAPHTHALENE	mg/l	0.05	<0.05	<0.05	0
	C6 - C9	µg/l	20	<20.0	<20.0	0
	C10 - C14	µg/l	50	<50.0	<50.0	0
	C15 - C28	µg/l	100	<100.0	<100.0	0
	C29 - C36	µg/l	100	<100.0	<100.0	0
	C10 - C36 (Sum of total)	µg/l	100	<100.0	<100.0	0
	C10-C16	mg/l	0.05	<0.05	<0.05	0
	C16-C34	mg/l	0.1	<0.1	<0.1	0
	C34-C40	mg/l	0.1	<0.1	<0.1	0
	C6 - C10	mg/l	0.02	<0.02	<0.02	0

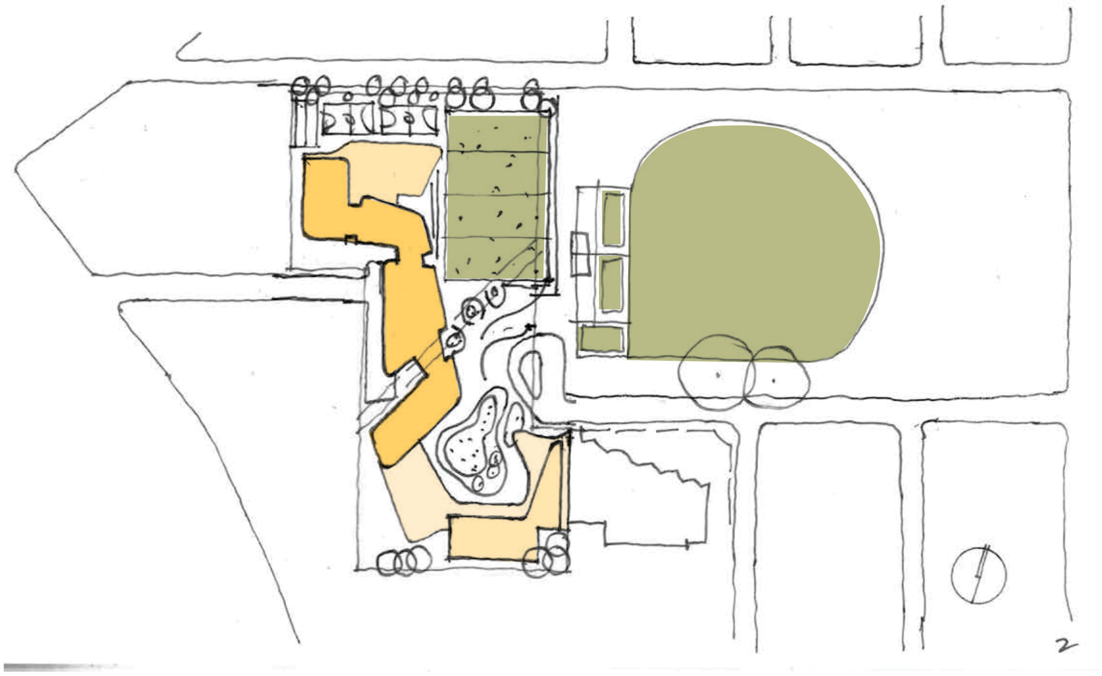
*RPDs have only been considered where a concentration is greater than 0 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 200 (0-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Field Blanks (WATER)
Filter: Lab_Report_Number in('542888')

Chem_Group	ChemName	Units	EQL	542888	542888
			Field ID	TB	TS
			Sampled_Date/Time	19/04/2017	19/04/2017
			Sample Type	Trip_B	Trip_S
BTEX	Benzene	µg/l	1	<1	103%
	Ethylbenzene	µg/l	1	<1	101%
	Toluene	µg/l	1	<1	105%
	Xylene (m & p)	µg/l	2	<2	109%
	Xylene (o)	µg/l	1	<1	111%
	Xylene Total	µg/l	3	<3	110%
	C6-C10 less BTEX (F1)	mg/l	0.02	<0.02	-
	Naphthalene	µg/l	1	<10	79%
	C6 - C9	µg/l	20	<20	93%
	C6 - C10	mg/l	0.02	<0.02	106%

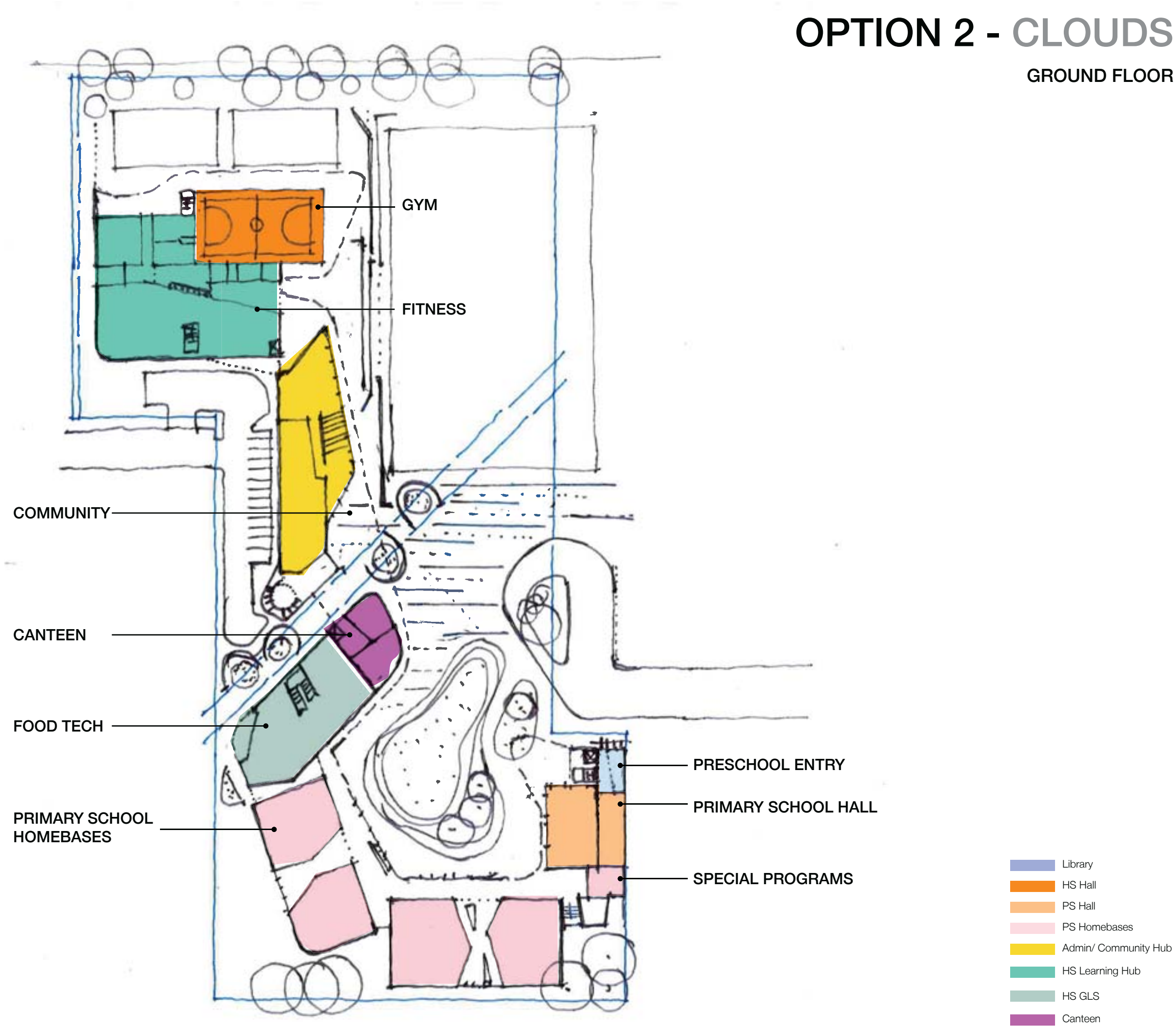
Appendix A – Concept Design Drawings

OPTION 2 - CLOUDS



OPTION 2 - CLOUDS

GROUND FLOOR



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Appendix B – Lotsearch Report

Environmental Risk and Planning Report

Alexandria Park Community School, Park Road, Alexandria, NSW 2015

Report Buffer: 1000m

Report Date: 25 Jan 2017 16:51:15

Table of Contents

Location Confidences

Where Lotsearch has had to georeference features from supplied addresses, a location confidence has been assigned to the data record. This indicates a confidence to the positional accuracy of the feature. Where applicable, a code is given under the field heading “LC” or “LocConf”. These codes lookup to the following location confidences:

LC Code	Location Confidence
1	Georeferenced to the site location / premise or part of site
2	Georeferenced with the confidence of the general/approximate area
3	Georeferenced to the road or rail
4	Georeferenced to the road intersection
5	Feature is a buffered point
6	Land adjacent to Georeferenced Site
7	Georeferenced to a network of features

Dataset Listing

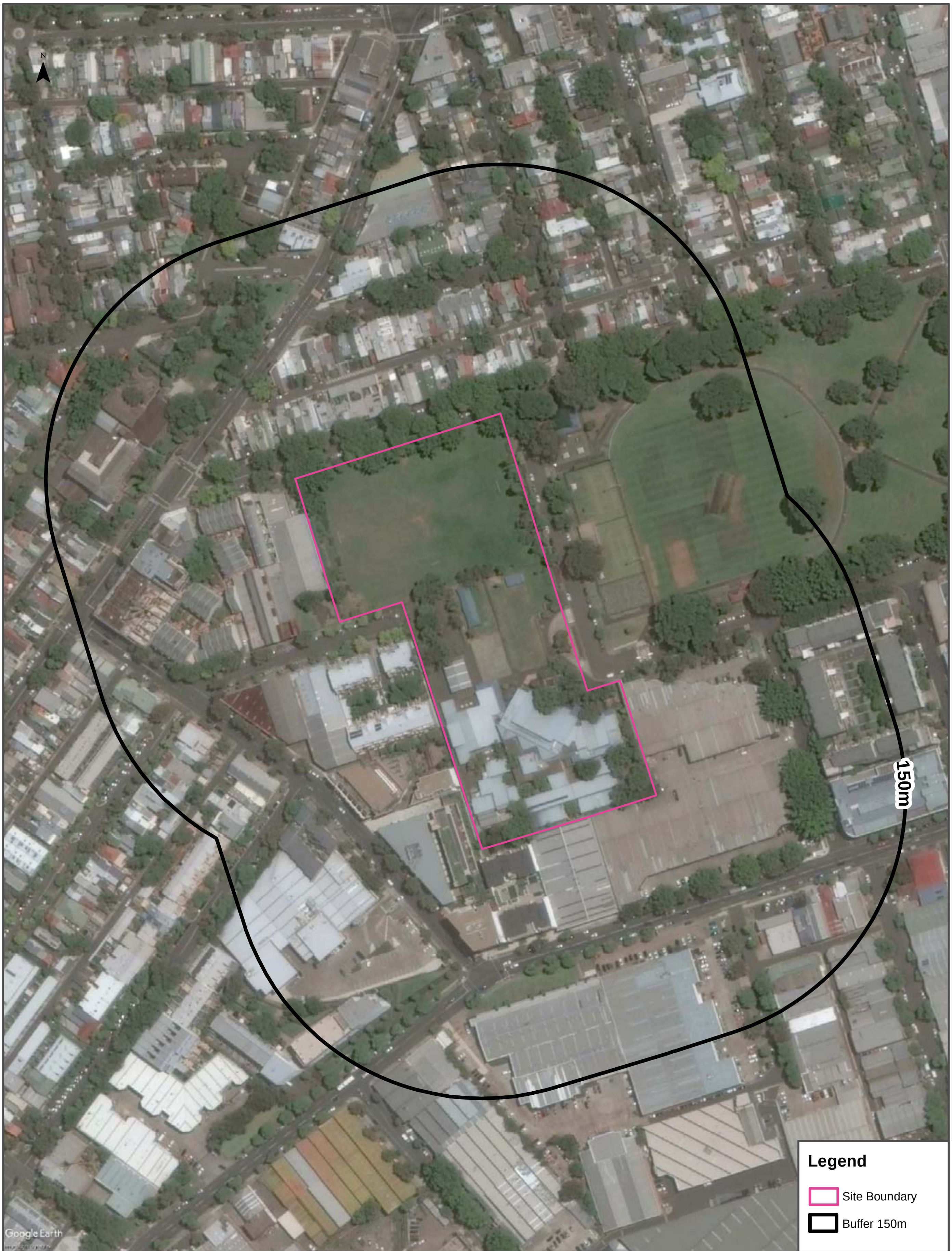
Datasets contained within this report, detailing their source and data currency:

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	No. Features Onsite	No. Features within 100m	No. Features within Buffer
Cadastre Boundaries	Land and Property Information	25/01/2017	25/01/2017	Daily	-	-	-
Topographic Data	Land and Property Information	10/04/2015	01/04/2015	As required	-	-	-
List of NSW contaminated sites notified to EPA	Environment Protection Authority	13/01/2017	09/01/2017	Monthly	0	0	17
Contaminated Land: Records of Notice	Environment Protection Authority	10/01/2017	10/01/2017	Monthly	0	0	4
Former Gasworks	Environment Protection Authority	10/01/2017	29/12/2016	Monthly	0	0	1
National Waste Management Site Database	Geoscience Australia	01/11/2016	15/11/2012	Quarterly	0	0	1
Licensed Activities under the POEO Act 1997	Environment Protection Authority	04/01/2017	22/12/2016	Monthly	0	0	1
Delicensed POEO Activities still Regulated by the EPA	Environment Protection Authority	04/01/2017	22/12/2016	Monthly	0	0	5
Former POEO Licensed Activities now revoked or surrendered	Environment Protection Authority	04/01/2017	22/12/2016	Monthly	0	0	11
UPSS Environmentally Sensitive Zones	Department of Environment, Climate Change and Water (NSW)	14/04/2015	12/01/2010	As required	1	1	1
UBD Business to Business Directory 1991	Hardie Grant			Not required	0	24	41
UBD Business Directory 1991 Motor Garages/Service Stations	Hardie Grant			Not required	0	0	10
UBD Business Directory 1970	Hardie Grant			Not required	6	109	155
UBD Business Directory 1970 Drycleaners & Motor Garages/Service Stations	Hardie Grant			Not required	0	1	46
UBD Business Directory 1950	Hardie Grant			Not required	3	55	97
UBD Business Directory 1950 Drycleaners & Motor Garages/Service Stations	Hardie Grant			Not required	0	2	46
Points of Interest	Land and Property Information	10/04/2015	01/04/2015	Annually	2	5	85
Tanks (Areas)	Land and Property Information	10/04/2015	01/04/2015	Annually	0	0	0
Tanks (Points)	Land and Property Information	10/04/2015	01/04/2015	Annually	0	0	0
Major Easements	Land and Property Information	11/06/2014	11/06/2014	As required	0	0	3
State Forest	Land and Property Information	11/04/2016	23/01/2015	As required	0	0	0
NSW National Parks and Wildlife Service Reserves	NSW Office of Environment and Heritage	11/04/2016	31/12/2015	Annually	0	0	0
Hydrogeology Map of Australia	Commonwealth of Australia (Geoscience Australia)	08/10/2014	17/03/2000	As required	1	1	1
Groundwater Boreholes	NSW Department of Primary Industries - Office of Water / Water Administration Ministerial Corporation; Commonwealth of Australia (Bureau of Meteorology) 2015	21/03/2016	01/12/2015	Annually	0	0	357
Geological Units 1:100,000	NSW Department of Industry, Resources & Energy	20/08/2014		None planned	1	-	3
Geological Structures 1:100,000	NSW Department of Industry, Resources & Energy	20/08/2014		None planned	0	-	0
Naturally Occurring Asbestos Potential	NSW Department of Industry, Resources & Energy	04/12/2015	24/09/2015	Unknown	0	0	0
Soil Landscapes	NSW Office of Environment and Heritage	12/08/2014		None planned	1	-	4
Standard Local Environmental Plan Acid Sulfate Soils	NSW Planning and Environment	07/10/2016	07/10/2016	As required	2	-	-
Dryland Salinity Assessment	National Land and Water Resources Audit	18/07/2014	12/05/2013	None planned	0	0	0
Mining Subsidence Districts	Land and Property Information	31/08/2016	31/08/2016	As required	0	0	0
SEPP 14 - Coastal Wetlands	NSW Planning and Environment	17/12/2015	24/10/2008	Annually	0	0	0

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	No. Features Onsite	No. Features within 100m	No. Features within Buffer
SEPP 26 - Littoral Rainforest	NSW Planning and Environment	17/12/2015	05/02/1988	Annually	0	0	0
SEPP 71 - Coastal Protection	NSW Planning and Environment	17/12/2015	01/08/2003	Annually	0	0	0
SEPP Major Developments 2005	NSW Planning and Environment	09/03/2013	25/05/2005	Under Review	0	0	1
SEPP Strategic Land Use Areas	NSW Planning and Environment	06/07/2016	28/01/2014	Annually	0	0	0
Local Environmental Plan - Land Zoning	NSW Planning and Environment	03/01/2017	04/09/2016	Quarterly	1	16	155
Local Environmental Plan - Minimum Subdivision Lot Size	NSW Planning and Environment	03/01/2017	04/09/2016	Quarterly	0	-	-
Local Environmental Plan - Height of Building	NSW Planning and Environment	03/01/2017	04/09/2016	Quarterly	1	-	-
Local Environmental Plan - Floor Space Ratio	NSW Planning and Environment	03/01/2017	04/09/2016	Quarterly	1	-	-
Local Environmental Plan - Land Application	NSW Planning and Environment	03/01/2017	04/09/2016	Quarterly	1	-	-
Local Environmental Plan - Land Reservation Acquisition	NSW Planning and Environment	03/01/2017	04/09/2016	Quarterly	0	-	-
State Heritage Items	NSW Planning and Environment	03/01/2017	30/10/2015	Quarterly	0	1	8
Local Heritage Items	NSW Planning and Environment	03/01/2017	04/09/2016	Quarterly	1	4	156
Bushfire Prone Land	NSW Rural Fire Service	11/11/2016	12/08/2016	Quarterly	0	0	0
Native Vegetation of the Sydney Metropolitan Area	NSW Office of Environment and Heritage	08/10/2014	11/10/2013	As required	1	1	1
RAMSAR Wetlands	Commonwealth of Australia Department of the Environment	08/10/2014	24/06/2011	As required	0	0	0
ATLAS of NSW Wildlife	NSW Office of Environment and Heritage	25/01/2017	25/01/2017	Daily	-	-	-

Aerial Imagery 2016

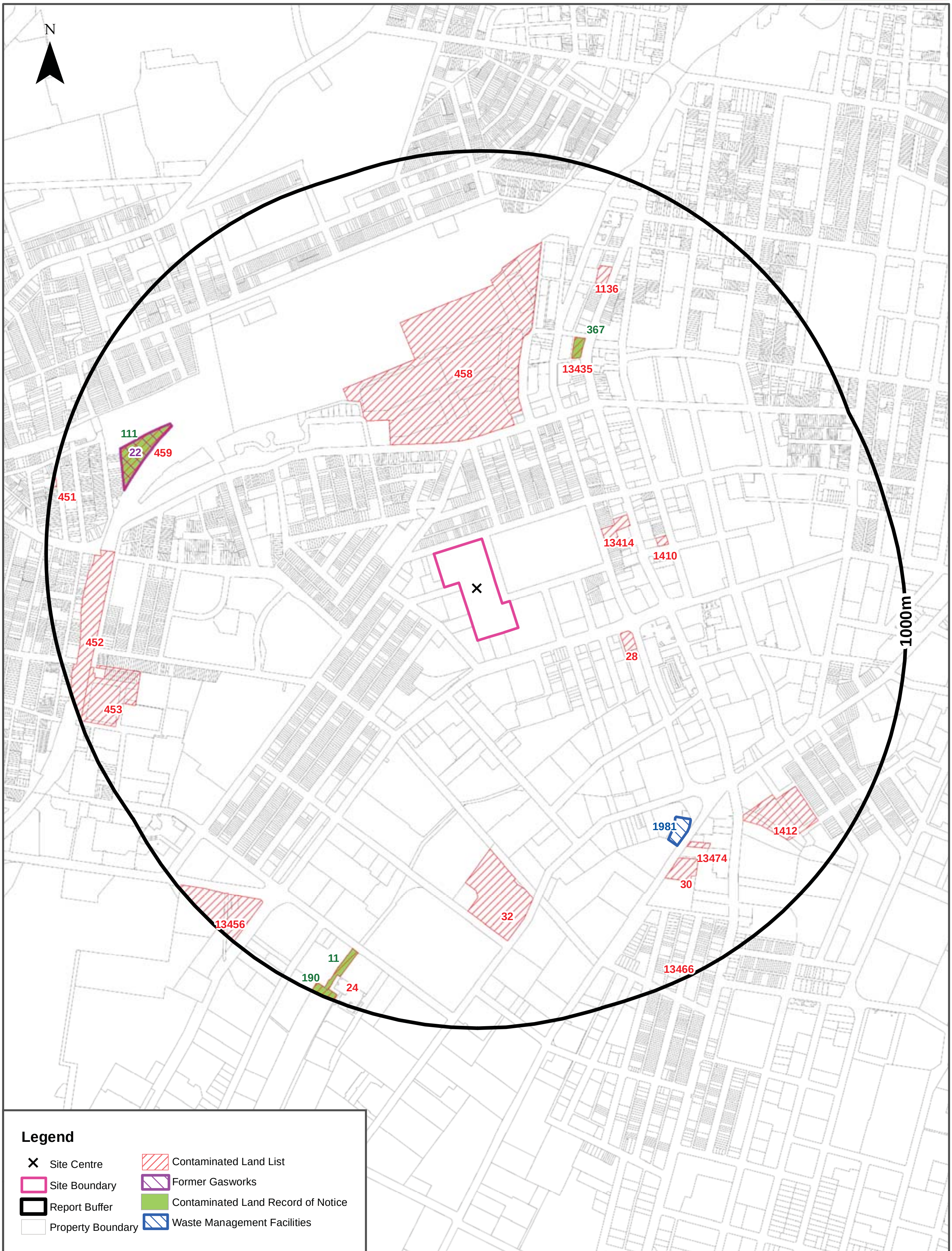
Alexandria Park Community School, Park Road, Alexandria, NSW 2015



Scale: 0 25 50 100 Meters	Data Sources: Aerial Imagery © 2016 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.	Coordinate System: GDA 1994 MGA Zone 56	Date: 20January, 2017

Contaminated Land & Waste Management Facilities

Alexandria Park Community School, Park Road, Alexandria, NSW 2015



Scale: 0 100 200 400 Meters

Data Sources: Property Boundaries & Topographic Data: © Land and Property Information (a division of the Department of Finance and Services) 2017

Coordinate System: GDA 1994 MGA Zone 56

Date: 25January 2017

Contaminated Land & Waste Management Facilities

Alexandria Park Community School, Park Road, Alexandria, NSW 2015

List of NSW contaminated sites notified to EPA

Records from the NSW EPA Contaminated Land list within the report buffer:

Map Id	Site	Address	Suburb	Activity	EPA site management class	Status	Dist	Direction	LC
458	Australian Technology Park	Henderson Road	Eveleigh	Other Industry	Regulation under CLM Act not required	Current EPA List	258m	North	1
28	Caltex Alexandria Service Station	133 Wyndham St, cnr McEvoy Street	Alexandria	Service Station	Regulation under CLM Act not required	Current EPA List	262m	East	1
13414	Alexandria Gardens	146-156 Wyndham St & 146-156 Botany Rd	ALEXANDRIA	Unclassified	Under assessment	Current EPA List	289m	North East	1
1410	Proposed Construction Site	2 John Street	Waterloo	Other Industry	Regulation under CLM Act not required	Current EPA List	406m	East	1
13435	Formerly Gas N Go Alexandria (fully redeveloped into residential apartment as of September 2016)	10-20 Botany ROAD	ALEXANDRIA	Service Station	Contamination currently regulated under CLM Act	Current EPA List	519m	North East	1
32	Perry Park	1B Maddox Street	Alexandria	Landfill	Regulation under CLM Act not required	Current EPA List	540m	South	1
13474	Former Industrial Site	16 O'Riordan STREET	ALEXANDRIA	Other Industry	Under assessment	Current EPA List	707m	South East	1
1136	BP Service Station	116 Regent Street	Redfern	Service Station	Under assessment	Current EPA List	722m	North	1
30	Former Mobil Service Station	20 O'Riordan Street	Alexandria	Service Station	Regulation under CLM Act not required	Current EPA List	723m	South East	1
459	Macdonaldtown Triangle	Burren Street	Eveleigh	Gasworks	Contamination being managed via the planning process (EP&A Act)	Current EPA List	752m	West	1
1412	Waverley Woollahra Process Plant	355 Botany Road	Waterloo	Other Industry	Regulation under CLM Act not required	Current EPA List	754m	South East	1
453	Redevelopment Site	36/1A Coulson Street	Erskineville	Unclassified	Under assessment	Current EPA List	813m	West	1
452	RailCorp land	Coulson Street	Erskineville	Other Industry	Under assessment	Current EPA List	822m	West	1
24	Alexandra Canal Sediments	Off Huntley Street	Alexandria	Unclassified	Contamination currently regulated under CLM Act	Current EPA List	857m	South West	7
13456	Sydney Park	Sydney Park, Alexandria ROAD	ALEXANDRIA	Landfill	Under assessment	Current EPA List	871m	South West	1
451	Department of Housing	52 John Street	Erskineville	Other Industry	Regulation under CLM Act not required	Current EPA List	987m	West	1
13466	Redevelopment Site	63-85 Victoria STREET	BEACONSFIELD	Other Industry	Under assessment	Current EPA List	997m	South East	1

The values within the EPA site management class in the table above, are given more detailed explanations in the table below:

EPA site management class	Explanation
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the Environmental Planning and Assessment Act 1979 (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination currently regulated under CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record of Notices.
Contamination currently regulated under POEO Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the Protection of the Environment Operations Act 1997 (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). The contamination was addressed under the CLM Act.
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed under the Protection of the Environment Operations Act 1997 (POEO Act).
Contamination was addressed via the planning process (EP&A Act)	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the Environmental Planning and Assessment Act 1979 (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the Contaminated Land Management Act 1997 (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record of Notices.
Regulation being finalised	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997. A regulatory approach is being finalised.
Regulation under the CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the Contaminated Land Management Act 1997 is not required.
Under assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or Protection of the Environment Operations Act 1997. Alternatively, the EPA may require information via a notice issued under s77 of the Contaminated Land Management Act 1997 or issue a Preliminary Investigation Order.

NSW EPA Contaminated Land List Data Source: Environment Protection Authority

Contaminated Land & Waste Management Facilities

Alexandria Park Community School, Park Road, Alexandria, NSW 2015

Contaminated Land: Records of Notice

Record of Notices within the report buffer:

Map Id	Area No	Name	Address	Suburb	Notices	Distance	Direction	LC
367	3401	Formerly Gas N Go Alexandria (fully redevloped into residential apartments)	10-20 Botany Road	Alexandria	2 current	519m	North East	1
111	3339	Macdonaldtown Triangle	Burren Street	Eveleigh	2 former	752m	West	1
11	3151	Alexandra Canal Sediments	Off Huntley Street	Alexandria	2 current	857m	South West	1
190	3151	Alexandra Canal Sediments	Off Coward Street	Mascot	2 current	974m	South West	1

Contaminated Land Records of Notice Data Source: Environment Protection Authority

Former Gasworks

Former Gasworks within the report buffer:

Map Id	Location	Council	Further Info	Distance	Direction	LC
22	Macdonaldtown Triangle, Erskineville	Council of the City of Sydney	Search record of EPA notices	752m	West	1

Former Gasworks Data Source: Environment Protection Authority

National Waste Management Site Database

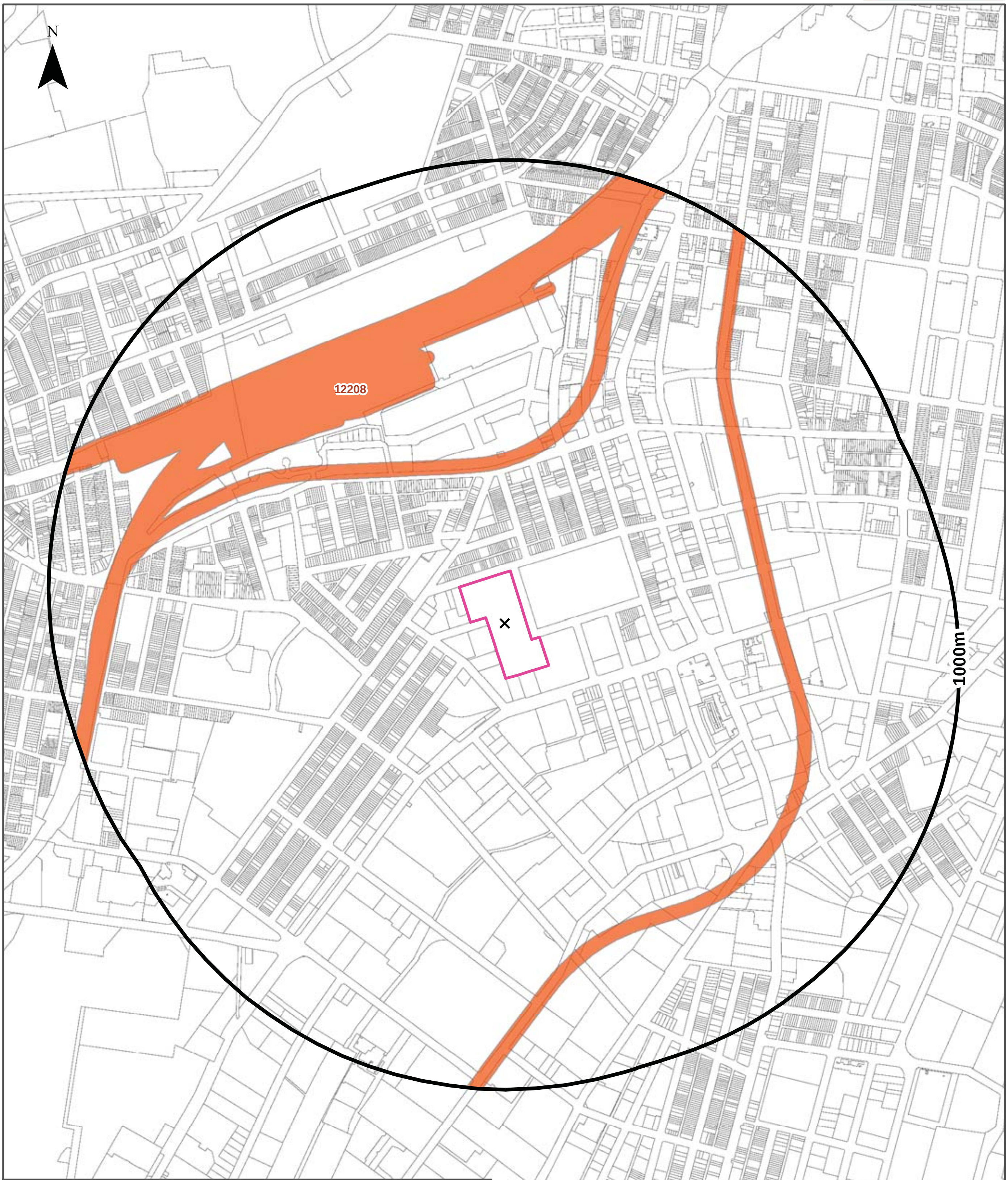
Sites on the National Waste Management Site Database within the report buffer:

Site Id	Owner	Name	Address	Suburb	Postcode	Landfill	Reprocess	Transfer	Distance	Direction	LC
1981	Cardinal Group Pty Ltd	Reefway Waste	3-7 O'Riordan Street	Alexandria	2015	Not Applicable	Operating	Operating	635m	South East	1

Wate Management Facilities Data Source: Australian Governement Geoscience Australia

Current EPA Licensed Activities

Alexandria Park Community School, Park Road, Alexandria, NSW 2015



Legend

- Site Centre
- Site Boundary
- Report Buffer
- Property Boundary
- Current Licensed Activities under POEO Act
- Current Licences related to Other Activities incl. Application of Herbicides to Waterways
- Current Licences related to Irrigated Agriculture

Scale: 0 100 200 400 Meters	Data Sources: Property Boundaries & Topographic Data: © Land and Property Information (a division of the Department of Finance and Services) 2017	Coordinate System: GDA 1994 MGA Zone 56	Date: 25January 2017

EPA Activities

Alexandria Park Community School, Park Road, Alexandria, NSW 2015

Licensed Activities under the POEO Act 1997

Licensed activities under the Protection of the Environment Operations Act 1997, within the report buffer:

EPL	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
12208	SYDNEY TRAINS		PO BOX K349, HAYMARKET, NSW 1238		Railway systems activities	3	249m	West

POEO Licence Data Source: Environment Protection Authority