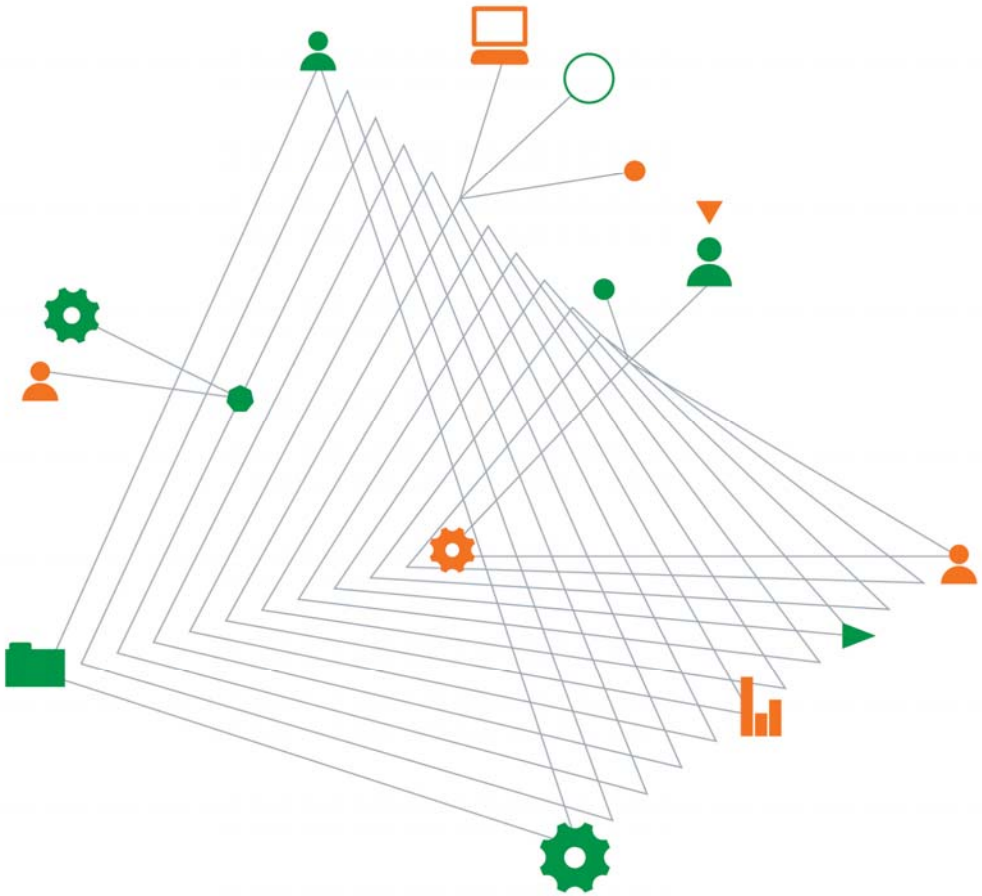
Develco Pty Ltd

Preliminary Environmental Review
14-16 & 18-20 Orion Road, Lane Cove West

18 June 2015



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Preliminary Environmental Review
14-16 & 18-20 Orion Road, Lane Cove West

Prepared for
Develco Pty Ltd

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1. Introduction

Develco Pty Ltd (Develco) is proposing to lodge an application to rezone land situated at 14-16 and 18-20 Orion Road (the 'site') for proposed mixed use development. Develco appointed Coffey Environments Australia Pty Ltd (Coffey) to prepare a Preliminary Environmental Review to support the rezoning application.

The Preliminary Environmental Review has been prepared in accordance with Coffey's fee proposal dated 1 June 2015 (Ref: ENAURHOD04594AB-P01),).

1.1. Background

Develco is evaluating various residential/mixed use schemes for the site (14 – 16 and 18 – 20 Orion Rd, Lane Cove West). It is envisaged that the proposed development would include new basement parking associated with mainly residential development of 14 – 16 Orion Rd, while 18 – 20 Orion Rd would involve demolition of existing building and associated car parking prior to development. At this stage, further details regarding the layout of the proposed mixed use development was not available.

Coffey has previously completed ESA reports for the site, documented as follows:

- Coffey (2006), 'Environmental Site Assessment of Proposed Childcare Centre, 18 – 20 Orion Rd, Lane Cove West NSW', Ref: ENVILCOV0300AAAA-AD Final ESA.
- Coffey (2007), 'Environmental Site Assessment of 14 – 16 Orion Rd, Lane Cove West NSW', Ref: ENVILCOV00397AA-R03.

Data within the above reports has been used in the preparation of the Preliminary Environmental Review.

1.2. Objectives

The objective of this project is to carry out a review of readily available information for the site with regard to potential or identified land contamination which may present a constraint for the land uses proposed under the rezoning.

The environmental review will largely be based on review of existing ESA information, updated by site walkover and a limited desktop review in order to assess current site condition/ changes to the site since 2006/07.

A letter report will be prepared covering the two lots comprising the site, generally meeting the information requirements specified in the State Environmental Planning Policy (SEPP) 55 – Remediation of Land, supporting the rezoning application.

1.3. Scope of works

To meet the objective and requirements of this project, the following scope of works were undertaken:

- Review the previous reports prepared by Coffey for the site in the context of current guidelines and the land uses considered under the proposed rezoning application.
- Conduct a site walkover to current site use and condition, including changes that may have occurred on the sites since Coffey previously visited the site (i.e. December 2006/2007).
- Review of information from the following sources:

- Current and historical aerial photographs of the site, with regard to changes of land use or landform since 2006;
- Contaminated land records and environmental protection licence information in the public registers held by the NSW Environment Protection Authority (EPA); and
- Registered groundwater bore information in the public register held by NSW Office of Water.

2. Site Location and Description

2.1. Site Location

The site location information is summarised in Table 2.1. The site location and layout plan is shown in Figures 1 and 2, respectively.

Table 2.1: Site Identification

Site Address:	Property Nos. 14-16 and 18-20 Orion Road, Lane Cove West, NSW 2066
Site Identification:	Lots 1 and 2 of Deposit Plan (DP) 1095363
Current Zoning:	IN2 – Light Industrial (Lane Cove Council- Local Environmental Plan)
Site Area:	Approximately 16,820 m^2

2.2. Site Description

An experienced Coffey environmental scientist undertook a site walkover on 12 June 2015. The building manager, Mr Jose Dieguez, provide access to site and to the storage areas in the car park. Coffey did not access upper levels of the building.

Description of current site condition at 14-16 and 18-20 Orion Road is provided in sections below. Photographic record is provided in Appendix A.

2.2.1. 14-16 Orion Road

The following observations were made with regards to the current site condition:

- This lot is approximately square in shape. It is bounded by Orion Road along the east and southern boundary, by 18-20 Orion Road to the north and commercial built area to the west.
- This portion of the site is vacant land with overgrown vegetation including mature trees, weeds and grasses.
- Bitumen gravel with sparse grass was observed across the southern section.
- Minor fragments of anthropogenic waste were observed across the surface of this portion of the site, including fragments of plastic pipe, paper, glass and metal.
- No evidence of significant contamination, such as oily stains, odours or materials suspected to contain asbestos, was observed on the ground surface.

2.2.2. 18-20 Orion Road

The following observations were made with regards to the current site condition:

- This portion of the site approximately rectangular shape, oriented in an east-west direction. It is bounded by Orion Road to the east, a strip of bushland along the northern and western boundaries then commercial properties (SC Johnson & Son Pty Ltd), commercial properties on

the western portion of the southern boundary and vacant land (14-16 Orion Road) on the eastern portion of the southern boundary.

- The central portion of 18-20 Orion Road is occupied by a multi-storey rectangular building with three levels of underground parking (Levels A1-A3). The car park extends from the building footprint to the west.
- A loading dock and waste management area is located at ground level on the southern end of the building.
- A small area with brick ground surface with chairs and a table is present to the east of the building.
- The car park is accessible via a sealed surface access road that extends from Orion Road along the southern portion of the lot to the west from the building.
- A childcare centre facility is located at the western end of the car park with additional playground to the west. The childcare centre has a car parking area to the west. This car park is accessible via Sirius Road. Air conditioning units are located underneath the childcare centre.
- Anthropogenic waste including demolition materials (including wood, toilet basins, plasterboards and plastic) was visible from the ground level and downslope on the bush strip at the western end of the site.
- Landscaped garden areas are present at the entrance of the building. Mature trees are present on the north-eastern and western end of the lot.
- No apparent evidence of decolouration or illness was evident in canopy of trees or planted vegetation in the landscaped areas within the site.
- A large rectangular water tank is present at the base level of the underground car park at approximately the south-western end of the building.
- Large exhaust pipes, part of the car park exhaust system, are present at the southern boundary to the west of the water tank.
- An electric substation is present to the south of the Childcare Centre playground.
- PVC pipes were observed running west-east along the northern edge of the car park. Coffey was informed that these pipes are part of the stormwater and planted pot runoff system.
- Drain structures were observed on the western portion of the site in the vicinity of the childcare centre playground area.
- A portion of a square shaped sandstone brick structure was observed to the north of the access road near Orion Road. A black pipe was observed on its western face. The function of this structure could not be determined during the site walkover.
- Small storage rooms are present in the carpark area and underneath the building footprint. It was indicated that some of these storage areas are used by the tenants. Coffey was given access to those used by the building management. The inspected rooms were used for storage of maps, paper boxes, light bulb and cleaning substances (Level A1), control boxes and general building maintenance items (Level A2) or paint containers (Level A3). No evidence of significant contamination such as spills or stains was observed within the underground car park areas.

2.3. Surrounding Land Uses

The following observations were made during the site walkover with regards to surrounding land use:

Table 2.2: Summary of Surrounding Land Uses

North:	A strip of bushland is situated to the north of 18-20 Orion Road then steep slope then commercial property occupied by SC Johnson and Son Pty
East:	Orion Road then commercial properties
South:	Orion Road then commercial properties
West:	14-16 Orion Road: commercial properties then Sirius Road. 18-20 Orion Road: bushland strip and access to Sirius Road.

2.4. Local Geology and Hydrogeology

The 1:250,000 Geological Survey of New South Wales (Third Edition, Map No. S1 56-5, 1966) map of Sydney indicates that the geology anticipated within the site and the surrounding areas is sandstone, quartz and shale of the Triassic Hawkesbury Sandstone Group.

A review of the Acid Sulfate Soil Risk Map for Prospect/Parramatta River (2nd Edition, 1997) indicated the site is located in an area of no known occurrences of acid sulfate soil materials.

The nearest water course is Stringybark Creek located about 250m to the north of the site. Stringybark Creek flows into Lane Cove River approximately 250m to the west of the investigation area. Groundwater is expected to be present in the bedrock beneath the investigation area and based on the slope would be expected to flow to the north towards Stringybark Creek. Perched seepage water could be present on the top of the sandstone bedrock following heavy rainfall events.

Based on the steep slope of the surrounding area, surface water occurring on the site and groundwater beneath the site would be anticipated to flow to Stringybark Creek.

3. Review of Previous Reports

3.1. Coffey (2006) & Coffey (2007a) Environmental Site Assessment: 18 – 20 Orion Road, Lane Cove

Coffey (2006) and Coffey (2007a) prepared an Environmental Site Assessments (ESA) for the western portion of 18-20 Orion Road, to support the establishment of the childcare centre currently on site (Coffey 2006), and subsequent study to support the divestment of the site (Coffey 2007a). The ESA included a desktop study and intrusive investigation which comprised:

- Seventeen hand auger bores denoted DHA1 to DHA15; HA1, and HA2,
- Four test pits excavations denoted TP1 to TP4, and
- One grab sample from a wall.
- Analysis of 31 soil samples for a range of contaminants of potential concern (COPC) including total petroleum hydrocarbons (TPH fractions C_6-C_{36}), benzene, toluene, ethylbenzene and xylenes (BTEX), organochlorine pesticides (OCP), polychlorinated biphenyl (PCB), volatile organic compounds (VOC), semi-volatile organic compounds (SVOC) and asbestos.

The site assessment criteria included:

- NSW EPA (2006) *Guidelines for the NSW Site Auditor Scheme*: Health and Phytotoxicity guideline criteria for heavy metals and PAH
- NSW EPA (1994) *Guidelines for Assessing Service Station Sites*: health guideline criteria for TPH C6-C36 and BTEX,
- NEPC (1999) *National Environmental Protection (Assessment of Site Contamination) Measure (NEPM)*,
- enHealth (2006) and NSW EPA (31 March 2000) – *Interim policy advice stating that no asbestos should be present in surface soils*: for assessment of asbestos, and
- US EPA (2004) *Region 9 Preliminary Remediation Goals*.

In summary, Coffey (2007a) concluded that historical evidence suggested that the importation of contaminated fill onto the investigation area presented a moderate likelihood of introducing contamination to the site. Activities associated with a former paper mill and current chemical manufacture located down the slope to the north presented a low likelihood of contamination. Field investigation indicated the site was underlain by fill overlying natural residual sandy soils and sandstone bedrock. The fill generally consisted of a mixture of sands, clays and gravels with some large deposits of crushed sandstone and shale. Trace anthropogenic materials were found in the fill. No evidence of significant contamination was found at the sampling locations.

Based on the findings, Coffey concluded that the contamination identified in the fill material did not represented significant contamination and that there was low likelihood of significant contamination being present exceeding the criteria adopted for the childcare development. Therefore, it was concluded the site was suitable, with respect to contamination, for the continued commercial use of the site and the proposed childcare centre development.

Groundwater was not assessed as part the existing ESA. Coffey (2006) indicated that groundwater is likely to be present in sandstone bedrock and that the site history suggested there to be a low likelihood of significant groundwater contamination (if any) being present. The low levels of

contamination detected in fill and residual soils overlaid bedrock across the site was considered not to require further assessment of groundwater quality.

3.2. Noel Arnold (1999) – Due Diligence & Hazardous Materials Risk Assessment

Coffey (2006) included as an appendix a report prepared by Noel Arnold (1999) "Technical Due Diligence Environmental & Hazardous Materials Risk Assessment" (Ref: S5126, dated 16 July 1999). The Noel Arnold (1999) assessment applies to the Compaq Building (i.e. current commercial building present within the central and eastern parts of 18-20 Orion Road). In summary, the findings of this assessment indicate that:

- The site has a low potential for major environmental liability,
- The site operations at the time indicated that the potential for significant and widespread contamination was low. No asbestos was found in one sample collected from the fibre cement sheet pipes located on the ground floor of the carpark. The building was built in the 1980s and this represents a low likelihood of asbestos being used as building material. Minor sources of Synthetic Mineral Fibres (SMF) were found in insulated ductwork, insulated hot water pipework, insulation batts, suspended ceiling tiles and on the soffit of Level 8.
- Unknown adjacent land use and the historical presence of a circular structure at the site results in the possibility of sub-surface contamination to be present.
- PCB containing oil may be present in the substation/transformers present on the southern side of the carpark.
- Air units present at each floor use hydrochlorofluorocarbon (HCFC) refrigerant that are ozone depleting chemicals. An interim date for phase-out of these types of refrigerants was set for the year 2016.

3.3. Coffey (2007b) – Environmental Site Assessment: 14 – 16 Orion Road, Lane Cove

Coffey prepared an ESA for 14-16 Orion Road in 2007. The ESA included a desktop study and field investigations with the purposes of divesting the property for commercial/industrial use.

Historical and site condition at the time suggested that the importation of contaminated fill onto the site presented a high likelihood of introducing contamination to the site while activities associated with the former paper mill and current chemical manufacture located down the slope to the north presented a low likelihood of contamination. A building of unknown use was present on the site from the 1960s up until around 1990 and it is possible that asbestos or chemical contamination could have been introduced to the site soils if the building was constructed with asbestos containing building materials and/or the building was used for chemical storage and use.

The field investigations consisted of excavating 19 test pits, collection of soil samples for laboratory analysis and assessment. A total of 28 soil samples were selected for analysis of heavy metals, TPH C6-C36, BTEX and PAHs. Eight of these samples were tested for OCP and PCB and six samples for VOC; three samples for SVOC and samples of fill for asbestos.

Groundwater sampling was excluded from the assessment.

The site assessment criteria for a commercial/industrial land use included:

- NSW EPA (2006) *Guidelines for the NSW Site Auditor Scheme*: Health and Phytotocity guideline criteria for heavy metals and PAH
- NSW EPA (1994) *Guidelines for Assessing Service Station Sites*: health guideline criteria for TPH C6-C36 and BTEX,
- NEPC (1999) *National Environmental Protection (Assessment of Site Contamination) Measure (NEPM)*,
- enHealth (2006) and NSW EPA (31 March 2000) – *Interim policy advice stating that no asbestos should be present in surface soils*: for assessment of asbestos, and
- US EPA (2004) *Region 9 Preliminary Remediation Goals*.

Field investigations indicated that fill soils were present across the site and were underlain by a thin layer of residual soils and sandstone bedrock. The fill soils contained anthropogenic materials, but no evidence of significant contamination such as oil staining or odours were observed. Fill soils were present across the site with depth ranging from a depth of approximately 0.4 to 2.5m below ground level (bgl). Fill at depths greater than 1.5m bgl were found within the large elongated fill mound in the central part of the site. Total fill volume was estimated to be in the order of 7,500m^3.

Laboratory analysis indicated that:

- Concentrations of heavy metals, TPH C_6-C_9, TPH C_{10}-$C_{36,}$ BTEX, PAH, PCB, OCP, VOC and SVOC were reported either below the limit of reporting (LOR) or detected below the site investigation levels.
- Asbestos in the form of bundles of fibres was detected in eleven samples at depths ranging from 0.2m to 3.1m bgs (UTP01 0.2-0.3, UTP02 0.6-0.7, UTP04 0.5-0.6, UTP07 0.2-0.3 & 0.5-0.6, UTP08 0.5-0.6 & 1.0-1.1, UTP09 3.0-3.1, UTP11 0.2-0.3, UTP13 0.5-0.6 and UTP15 0.2-0.3).

Coffey (2007) concluded that remediation or management of asbestos containing fill at the site was required for the site to be considered suitable for continued commercial or industrial land use. Two management options of asbestos contaminated fill were provided:

- Option 1 – capping of the impacted soil on site, and
- Option 2 – removal of the impacted soil to a licensed landfill.

3.4. Review of Assessment Currency

Coffey considers the information in ESA previously prepared by Coffey in 2006 and 2007 to be reasonably representative with regards to site history and overall contamination status. It is noted that the site assessment criteria adopted in these assessments to assess the contamination condition of the site has been superseded following the revision to the National Environment Protection (Assessment of Site Contamination) Measure in 2013.

4. Site History

As part of this assessment Coffey reviewed desktop information presented in previously prepared ESAs and supplemented this where appropriate to establish known historical uses of the site. A summary of this information is presented in the sections below.

4.1. Work Cover Dangerous Good Records

A search under the Stored Chemical Information Database and the microfiche records held by WorkCover NSW was undertaken for 14-16 and 18-20 Orion Road in November 2006 (Coffey 2006 and Coffey 2007). In summary, Coffey (2006) states that 'no WorkCover records were provided that suggest that dangerous goods were stored within the site'.

Coffey understands that no changes in land use of 14-16 and 18-20 Orion Road have occurred since 2006, thus it is considered the information provided in existing ESA is sufficient for the purposes of the present environmental review.

4.2. Land Title search

A search of Land Title records was conducted by Coffey as part of the previous ESA. In summary, the land title search indicated:

- The site (14-16 and 18-20 Orion Road) was owned by a paper manufacturer for 20 years from 1912.
- The site was subsequently owned by a number of companies including an acetic acid manufacturer (Robert Corbert Pty Ltd). It is understood that the manufacturing areas for these companies were down slope from the investigation area.
- The site was subsequently purchased by Ducru Pty Ltd's in 1987.

The site has remained within Ducru Pty Ltd's ownership since 1987.

4.3. Interviews

As part of the previous ESA, Coffey conducted interviews with Mr David Wiles of Develco Pty Ltd to obtain further information regarding the status of the site and historic land uses. In summary, the following anecdotal information was obtained:

- The current commercial building and multi-level car park located within 18-20 Orion Road was constructed between 1989 and 1991.
- A water tank had previously occupied the eastern part of the 18-20 Orion Road property.
- Develco was not aware not aware of any structures previously existing on 14-16 Orion Way and the site had been used for parking construction vehicles during the development of surrounding areas.
- Unconnected services may also be present beneath the site.
- Develco could not confirm the use of a former structure identified within aerial photographs prior to 1965, yet this structure would have been demolished pre-1990 to allow Orion Road to be extended Epping Road.

As part of the current assessment, discussions with Mr Doug Auchterlonie of Develco indicated that the only development at the site while under Ducru's ownership (since 1987) has been construction of the building located at 18-20 Orion Road in circa 1990s, and the childcare facility in mid 2000's.

4.4. Aerial Photography

As part of the previous ESA, Coffey reviewed selected historic aerial photographs for the site for the period between 1951 and 2004/2006. A summary of this review is presented below:

- A review of aerial photographs indicated that 14-16 Orion Road was bushland prior to the building of a structure in c.1965. The site reverted to bushland with a cleared area in the south after this structure was demolished in c.1990. The use of this structure is unknown.
- Aerial photographs for 18-20 Orion Road indicate that the this part of the site remained undeveloped from at least the 1930s until the 1970s when it was cleared and used for a car park before being reverted to bushland by the mid-1980s and was then developed with the commercial building and associated car park currently on site in the late 1980s.

As part of the current study, Coffey undertook a review of historical aerial photography from 1988 to date to supplement information provided in the previous ESAs. A summary of this review is presented in Table 4.1.

Table 4.1: Summary of review of historic aerial photography

Year	Site	Surrounding land
1988 (Colour)	The land corresponding to 14-16 Orion Road is vacant. Mature tree and shrubs are observed across the land and extending to the northern portion. Grassed surface is present at the southern portion. The fill mound described in Coffey (2006) appears covered by vegetation. A square building, car park and access road are visible on land corresponding to at 18-20 Orion Road. The disposition of these structures matches description made by Coffey (2007). A blue colour canopy is visible to the south-western corner of the car park, which corresponds to the Childcare Centre's playground area.	To the south and east, Orion Road is visible beyond which lies commercial built properties. To the north, lies bushland followed by commercial properties. To the west, commercial properties are adjacent to 14-16 Orion Road, beyond which lies Sirius Road.
2002 - 2013 (colour Historic Google Maps)	Historic imagery provided within Google Maps was reviewed for the period between 2002 and 2013 to supplement imagery supplied by the NSW Governments Land and Property Information Division. In summary, the images available span periods ranging between 1day up to 2years.	

Year	Site	Surrounding land
	In summary, these images indicate that no significant changes to land uses within the site occurred during this period, with the exception of the establishment of a small structure on the western portion of 18-20 Orion Road in 2009. This is inferred to comprise the child care facility considered within the ESA prepared by Coffey in 2006.	
2013 (Colour)	No major changes observed compared to the 2008 image.	No major changes observed compared to the 2008 image.
2015 (colour, Google Maps)	No major changes observed compared to the 2008 image.	No major changes observed compared to the 2008 image.

4.5. Contaminated Land Public Registers

Coffey undertook a search of the NSW EPA online contaminated land register on 12 June 2015. The search did not identify notices that have been issued by the NSW EPA under the Contaminated Land Management Act (1997) for the site, or properties immediately surrounding the site. This is consistently with historical searches previously undertaken by Coffey (2006 and 2007).

The search identified the following properties with notices under the NSW EPA register within the Lane Cove Municipality:

- A former petrol station site located on Mowbray Road at approximately 2.3km to the north-east from the site declared as significant contaminated land with an approved voluntary management proposal.
- The ‘Pacific Power Property’ on Lot 1 Sirius Road, Lane Cove at approximately 200m west from the site. This property holds a current management order. The management order applies to any works or activities that can result in modification of a clay capping layer on this site.

Coffey considers the notices for the two above sites are unlikely to affect ground conditions within the site.

Summary of NSW EPA online register search is presented in Appendix B.

5. Review of Available Investigation Data

5.1. General

As noted above, the assessment criteria considered within the ESA prepared by Coffey in 2006 and 2007 have been superseded following the revision to National Environment Protection (Assessment of Site Contamination) Measure in 2013. As part of this assessment, data from previous investigations were compared to relevant health and ecological assessment criteria published within *Schedule B1 Guidelines on Investigation Levels for Soil and Groundwater* (NEPC, 1999 as amended 2013). In consideration of the proposed rezoning application for a mixed residential and commercial land uses, the following exposure scenarios were considered:

- Low Density Residential (A) land use: Residential with garden/accessible soil (home grown produce <10% fuit and vegetable intake (no poultry)), also includes childcare centres, preschools and primary schools;
- High Density Residential (B) land use: Residential with minimal opportunities for soil access; includes dwellings with fully and permanently paved yard space such as high-rise buildings and apartments; and
- Commercial /industrial (D) land use: commercial/industrial, includes premises such as shops, offices, factories and industrial sites.

To compare data collected in previous investigations and the criteria within the Schedule B1 (NEPC, 1999), the following adjustments/assumptions were made:

- A concentration for Benzo(a)pyrene TEQ was calculated based on the reported concentrations of carcinogenic PAH and the relevant Toxicity Equivalent Factors presented within Schedule B1.
- The Health Screening Levels (HSL) for the fractions of total petroleum hydrocarbons (TPH) are not directly comparable with the fractions of total recoverable hydrocarbons (TRH) in NEPM (2013). To assess potential health risks from petroleum hydrocarbons, volatile fractions (i.e. TPH C_6-C_9 and TPH C_{10}-C_{14}) was compared to the soil vapour HSL presented within Friebel and Nadebaum (2011). Similarly, non-volatile fractions (i.e. TPH C_{15}-C_{28} and TPH C_{29}-C_{36}) were compared to the HSL for direct contact (Friebel and Nadebaum, 2011).
- The sampling procedures adopted within previous assessments do not allow direct comparison to the health assessment criteria presented within NEPC (1999). A provisional screening criterion of ‘detection’ was adopted for asbestos in soils.
- The limit of reporting (LOR) was adopted as preliminary health assessment criteria for VOC and SVOC that do not have an HSL published within NEPC (1999).

Available laboratory analytical data compared to the adopted health assessment criteria is presented within Table 1 in the rear of this report.

The NEPM (2013) requires assessment of ecological risk on terrestrial ecosystems with regards to contamination. In consideration of the proposed rezoning application for a mixed residential and commercial land uses, the following exposure scenarios were considered:

- Urban residential and public open space which is broadly equivalent to the land uses scenarios as in the human health risk assessment for Residential A and Residential B land use.
- Commercial and industrial

The amended NEPM (1999) includes ecological investigation levels (EILs) and ecological screening levels (ESLs) to assess the impact on site vegetation from contamination within the upper 2m of the subsurface.

Available investigation data do not include information such as soil pH, Cation Exchange Capacity (CEC) and clay content in soils to develop site specific EIL. For this assessment, the EIL were selected assuming the most conservative values.

Available laboratory analytical data compared to the adopted ecological assessment criteria is presented within Table 1 in the rear of this report.

5.2. Site Assessment: Discussion of Results

5.2.1. 14 – 16 Orion Road

Assessment of the laboratory results for 14 – 16 Orion Road (Coffey 2007) against criteria set out within NEPC (1999) indicated the following:

- Concentration of heavy metals, TPH, BTEX, PAHs, OCPs and PCB were below the investigation levels for Residential A, Residential B and Commercial/industrial land use.
- Concentration of VOC and SVOCs were reported below the LOR.
- Asbestos fibres as amosite (seven samples), chrysotile (four samples) and synthetic mineral fibres (one sample) were found in soils distributed from 0.2 to 3.1 m bgl.
- Concentrations of nickel, zinc and Benzo(a)pyrene were reported above the adopted ecological assessment criteria in a small number samples.

The portion of the site corresponding to 14-16 Orion Road has fill material containing friable asbestos. Other contaminants of potential concern were not reported at concentrations above the adopted health investigation levels. Friable forms of asbestos has the potential to pose health risks to workers during site redevelopment, users of neighbouring properties and future site users where existing site soils remain exposed following site development.

The assessment indicates that concentrations of heavy metals and Benzo(a)pyrene in fill have the potential to pose risks ecosystems in the event that such materials are retained on site.

5.3. 18 – 20 Orion Road

Assessment of the laboratory results for 18 – 20 Orion Road (Coffey 2007) indicated the following:

- Concentration of heavy metals, TPH, BTEX, PAHs, OCPs and SVOCs were below the investigation levels for Residential A, Residential B and Commercial/industrial land use.
- Concentration of VOC and SVOC were reported below the LOR.
- Asbestos fibres were not detected in the soil samples analysed for asbestos.
- Concentrations of nickel, zinc and TPH C15-C28 were reported above the adopted ecological assessment criteria in a small number samples.

The limited data available has not identified soils that pose potential health risks to workers during the development, users of neighbouring land or future site users for mixed residential and commercial/ industrial development scenario considered within the rezoning application.

5.4. Data gaps

The following data gaps have been identified following the review of available information:

- On review of the data presented within previous investigations, it is assessed that the number of sampling locations within the site exceeds the minimum number of sampling points recommended within the *Sampling Design Guidelines for Contaminated Sites* (NSW EPA, 1995). However there are a number of areas where the sampling density is lower, particularly within the building footprint and eastern part of 18-20 Orion Road. The degree of uncertainty associated with soils in these areas is inevitably higher.

- The investigation approach adopted in 18-20 Orion Road was predominantly based on hand augers which are less conducive to enabling to allowing anthropogenic inclusions (including potential asbestos containing materials) than other methods such as test pitting. Hence, whilst laboratory analysis has not detected asbestos containing materials, based on site history, it is considered plausible that ACM and/or asbestos fines may also exist in fill within 18-20 Orion Road.

- Groundwater quality was not previously assessed as part of previous investigations however it bis noted that groundwater was not observed at sampling locations. Coffey previously indicated that groundwater is likely to be present in sandstone bedrock and that the site history suggested there to be a low likelihood of significant groundwater contamination (if any) being present. The investigation data currently available suggests that the low levels of contamination detected in fill and residual soils overlaid bedrock across the site was considered not to require further assessment of groundwater quality.

6. Conclusions & Recommendations

The site comprises two individual properties; namely 14-16 Orion Road and 18-20 Orion Road. The latter property is currently occupied by a commercial office building and multi-storey car park. An area within the western part of this property is occupied by a childcare centre. The eastern part of 18-20 Orion Road and 14-16 Orion Road remain undeveloped land.

The site history review indicates that with the exception of the water tank, the site remained undeveloped until the 1960/70s where parts of the site were cleared for car parking and structure of unknown use. This structure appears to have been demolished in c.1990. The current commercial building and associated car park currently was established on site between 1989 and 1991. The childcare centre was established mid-2000s.

Two separate programmes of investigation were undertaken by Coffey in 2006 and 2007. The data presented within these reports were reviewed to obtain an understanding of contamination status in the context of a proposed rezoning application to redevelop the site for a mixture of residential and commercial uses. Based on a review of this data, the following contamination issues were identified which require further consideration:

- Asbestos in the form of bundles of fibres was detected in 10 samples of fill material collected from 14-16 Orion Road. Four samples were located within the fill mound while the other six samples were located in fill material in other parts of this property at a range of depths. It was considered that the asbestos detections would likely be associated with fill imported onto the site with possible contributions from the demolition of the former structure noted above. No asbestos contamination materials were identified in samples collected from 18-20 Orion Road.
- Concentrations of nickel, zinc, TPH C15-C28 and Benzo(a)pyrene were reported at concentrations exceeding the adopted ecological investigation levels.

Other contaminants of potential concern were reported at concentrations below the adopted assessment criteria.

Based on the review of available investigation data, it is assessed that the site can be made suitable for mixed residential and commercial/industrial development. However, remediation or management of asbestos present in fill material on the site will be required for the site to be considered suitable for these uses.

It is recommended that a Remedial Action Plan (RAP) is developed to mitigate the potential risks associated with asbestos impacted fill. It is recommended that the RAP is developed to manage potential ecological risks associated with heavy metals and Benzo(a)pyrene in soils. The RAP should be developed in consideration of the data gaps identified herein and present a strategy to identify and manage unexpected finds of contamination during the future redevelopment site.

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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.

Tables

TABLE 1 - Summary of Coffey (2006, 2007a an d2007b)'s Soil Laboratory Results and comparsion with the Health Investigation Levels

14-16 & 18-20 Orion Road, Lane Cove West

Analyte	Land use	Health Investigation Level (HIL)												Sample ID	TP1	TP1	TP2	TP3	TP3	TP4	HA1	HA1	HA1	GRAB 1	DHA1	DHA1	DHA2	DHA2	DHA2	DHA3	DHA3	DHA4	DHA5	DHA6	DHA7	DHA8
		Residential HIL A (mg/kg)					Residential HIL B (mg/kg)					Commercial /industrial HIL D (mg/kg)		Geological Origin	Fill	Fill	Fill	Fill	Residual	Fill	Fill	Fill	Residual	Fill	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Topsoil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil
		Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake (no poultry),					Residential with minimal opportunities for soil access; includes dwellings with fully and					Commercial/industrial includes premises such as shops, offices, factories and industrial sites		Soil Type	Asphalt	Gravelly Sand	Sandy Clay	Sandy Gravel	Clayey Sand	Topsoil	Silty Sand	Clayey Sand	Sand	-	Gravelly SAND	Gravelly SAND	Gravelly SAND	SAND	SAND	Silty SAND	Clayey SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND
														Date of Sampling	9/11/2006	9/11/2006	9/11/2006	9/11/2006	9/11/2006	9/11/2006	9/11/2006	9/11/2006	9/11/2006	9/11/2006	30/7/07	30/7/07	30/7/07	30/7/07	30/7/07	30/7/07	30/7/07	2/08/07	2/08/07	2/08/07	2/08/07	2/08/07
														Depth (m)	0.03-0.10	1.5-1.6	0.35-0.40	1.1-1.2	1.6-1.7	0.0-0.05	0.00-0.05	0.4-0.5	0.8-0.9	-	0.0-0.1	0.2-0.3	0.0-0.1	0.2-0.3	0.4-0.5	0.0-0.05	0.1-0.2	0.0-0.1	0.0-0.1	2.4-2.5	0.0-0.1	0.0-0.2
	Soil strata Soil type	0 m to <1m	1m to <2m	2m to <4m	>4m	[5]	0 m to <1m	1m to <2m	2m to <4m	>4m	[5]	0 m to <1m	1m to <2m	2m to <4m	>4m	[5]	Limit of Reporting (LOR) (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
HEAVY METALS																																				
Arsenic		100				[1]	500				[2]	3000				[3]	3	<3	<3	6	5	<3	<3	-	9	<3	<3	3	<3	3	4	4	<3	3	<3	<3	<3	<3	<3
Cadmium		20				[1]	150				[2]	900				[3]	0.1	0.3	0.3	0.1	0.4	<0.1	0.1	-	0.4	<0.1	0.2	0.3	0.2	0.4	0.4	0.3	0.1	0.2	0.1	<0.1	<0.1	<0.1	<0.1
Chromium (VI)		100				[1]	500				[2]	3600				[3]	0.3	6.8	9.4	12	6.7	11	5.7	-	25	5	6.5	12	7.7	11	9.9	11	6.7	7.7	8	5.2	5.1	7	4.3
Copper		6000				[1]	30000				[2]	17000				[3]	0.5	110	18	9.9	37	<0.5	8.4	-	50	4.1	13	20	15	56	31	25	7.4	9.3	6	53	7.8	9	3
Nickel		400				[1]	1200				[2]	6000				[3]	0.5	59	6.1	5.4	25	0.7	5	-	16	3.1	3.4	11	8	72	23	19.0	4.3	5.9	3.1	3.8	2.9	7.5	1.8
Lead		300				[1]	1200				[2]	1500				[3]	1	4	18	16	21	5	16	-	100	13	22	32	28	5	28	27	11	22	14	8	7	12	9.5
Zinc		7400				[1]	60000				[2]	400000				[3]	0.3	45	59	11	98	4.5	50	-	310	30	58	110	71	45	120	100	50	35	34	59	69	47	17
Mercury		40				[1]	120				[2]	730				[3]	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	0.22	<0.05	<0.05	0.05	<0.05	<0.05	0.07	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TOTAL PETROLEUM HYDROCARBONS																																				
C6 - C9 Fraction		180	640	1300	2600	[7]	180	640	1300	2600	[7]	650	2800	7000	15000	[7]	20	<20	<20	<20	<20	<20	<20	-	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
C10 - C14 Fraction		130	560	1200	2400	[7]	130	560	1200	2400	[7]	500	2400	NL	NL	[7]	20	<20	<20	<20	<20	<20	40	-	<20	<20	<20	<20	48	<20	<20	<20	<20	<20	<20	<20	<20	<20
C15 - C28 Fraction		4500				[7]	5800				[7]	27000				[7]	50	<50	<50	<50	<50	<50	290	-	<50	<50	<50	<50	240	<50	<50	<50	79	<50	<50	<50	<50	<50	<50
C29 - C36 Fraction		6300				[7]	8100				[7]	38000				[7]	50	<50	<50	<50	<50	<50	460	-	58	<50	<50	78	270	<50	<50	<50	290	<50	58	<50	<50	<50	<50
Total C10-C36																	120	<120	<120	<120	<120	<120	790	-	58	<120	<120	78	558	ND	ND	ND	369	ND	58	ND	ND	ND	ND
BTEX																																				
Benzene	Sand	0.5	0.5	0.5	0.5	[5]	0.5	0.5	0.5	0.5	[5]	3	3.0	3.0	3.0	[5]	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5										
	Silt	0.6	0.7	1	2	[5]	0.6	0.7	1	2	[5]	4	4	6	10	[5]																					
	Clay	0.7	1	2	3	[5]	0.7	1	2	3	[5]	4	6	9	20	[5]											<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	Sand	160	220	310	540	[5]	160	220	310	540	[5]	NL	NL	NL	NL	[5]	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
	Silt	390	NL	NL	NL	[5]	390	NL	NL	NL	[5]	NL	NL	NL	NL	[5]																					
	Clay	480	NL	NL	NL	[5]	480	NL	NL	NL	[5]	NL	NL	NL	NL	[5]																				<0.5	<0.5
Ethylbenzene	Sand	55	NL	NL	NL	[5]	55	NL	NL	NL	[5]	NL	NL	NL	NL	[5]	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Silt	NL	NL	NL	NL	[5]	NL	NL	NL	NL	[5]	NL	NL	NL	NL	[5]																					
	Clay	NL	NL	NL	NL	[5]	NL	NL	NL	NL	[5]	NL	NL	NL	NL	[5]																					
Total Xylene	Sand	40	60	95	170	[5]	40	60	95	170	[5]	230	NL	NL	NL	[5]	1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	-	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
	Silt	95	210	NL	NL	[5]	95	210	NL	NL	[5]	NL	NL	NL	NL	[5]																					
	Clay	110	310	NL	NL	[5]	110	310	NL	NL	[5]	NL	NL	NL	NL	[5]																					
POLYNUCLEAR AROMATICS																																				
Carcinogenic PAH (as BaP TEQ)		3				[1]	4				[2]	40				[3]	-	<LOR	-	0.06	-	<LOR	-	-	0.05	-	-		<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Naphthalene	Sand	3	NL	NL	NL	[5]	NL	NL	NL	NL		NL	NL	NL	NL		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	<0.1	<0.1	<0.1
	Silt	4	NL	NL	NL	[5]	NL	NL	NL	NL		NL	NL	NL	NL																							
	Clay	5	NL	NL	NL	[5]	NL	NL	NL	NL		NL	NL	NL	NL																							
Acenaphthylene																	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	<0.1	<0.1	<0.1	<0.1
Acenaphthene																	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	<0.1	<0.1	<0.1	<0.1
Fluorene																	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	<0.1	<0.1	<0.1	<0.1
Phenanthrene																	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	<0.1	<0.1	<0.1	<0.1
Anthracene																	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	<0.1	<0.1	<0.1	<0.1
Fluoranthene																	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	<0.1	<0.1	<0.1	<0.1
Pyrene																	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	<0.1	<0.1	<0.1	<0.1
Benzo[a]anthracene																	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	<0.1	<0.1	<0.1	<0.1
Chrysene																	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	<0.1	<0.1	<0.1	<0.1
Benzo[b,k]fluoranthene																	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	<0.2	<0.2	<0.2	<0.2
Benzo[b,j]fluoranthene																	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo[k]fluoranthene																	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo[a]pyrene																	0.05	<0.05	-	0.06	-	<0.05	-	-	0.05	<0.05	-	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno[123-cd]pyrene																	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	<0.1	<0.1	<0.1	<0.1
Dibenzo[ah]anthracene																	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	<0.1	<0.1	<0.1	<0.1
Benzo[ghi]perylene																	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	<0.1	<0.1	<0.1	<0.1
Total PAH's		300				[1]	400				[2]	4000				[3]	ND	ND	-	ND	-	ND	-	-	ND	ND	-	<1.58	<1.55	<1.55	<1.55	<1.55	<1.55	<1.55	<1.55	<1.55	<1.55	<1.55
ORGANOCHLORINE PESTICIDES																																				
DDT+DDE+DDD		240				[1]	600				[2]	3600				[3]	0.1	<0.1	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1
Aldrin and dieldrin		6				[1]	10				[2]	45				[3]	0.1	<0.1	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1
Chlordane		50				[1]	90				[2]	530				[3]	0.1	<0.1	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1
Endosulfan		270				[1]	400				[2]	2000				[3]	0.1	<0.1	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1
Endrin		10				[1]	20				[2]	100				[3]	0.1	<0.1	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1
Heptachlor		6				[1]	10				[2]	50				[3]	0.1	<0.1	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1
HCB		10				[1]	15				[2]	80				[3]	0.1	<0.1	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1
Methoxychlor		300				[1]	500				[2]	2500				[3]	0.1	<0.1	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1
Mirex		10				[1]	20				[2]	100				[3]	-	-	-	-	-	-	-	-	-	-	-	-	-										
Toxaphene		20				[1]	30				[2]	160				[3]	-	-	-	-	-	-	-	-	-	-	-	-	-										
POLYCHLORINATED BIPHENYLS																											-	-	ND	-	-	-	-	-	-	-	ND
Total PCBs		1				[1]	1				[2]	7				[3]	0.9	-	-	-	<0.90	<0.90	-	-	-	-	-												
VOLATILE ORGANIC COMPOUNDS																											-	-	-	-	-	-	-	-	-	-	-
Total VOCs		<LOR				[4]	<LOR				[4]	<LOR				[4]	-	-	-	-	<LOR	-	-	-	-	<LOR	-	-								<LOR		<LOR		
SEMI VOLATILE COMPOUNDS (US EPA 8270 Screen)																																				
Total SVOCs																	0.1-0.5	-	-	ND	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	<LOR	-	<LOR	-	-	-
ASBESTOS																																				
Asbestos		Detection					Detection					Detection					-	-	-	ND	-	-	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	-	ND	-	ND	ND	ND

Notes:

Concentration exceeds the Health Investigation Level A criteria for Residential land use

Concentration exceeds the Health Investigation Level B for Residential land use

Concentration exceeds the Health Investigation Level for commercial /industrial land use

1 Based on the Health Investigation Level (HIL) A for Residential landuse of the NEPM (2013).

2 Based on the Health Investigation Level (HIL) B for Residential landuse of the NEPM (2013).

3 Based on the Health Investigation Level (HIL) D for Commercial / industrial landuse of the NEPM (2013).

4 Laboratory limit of reporting (LOR) is adopted as a preliminary health assessment criteria due to HSL not avaialble for VOC and SVOC in NEPM (1999 amended 2013)

5 Based on the soil vapour intrusion Health Screening Level A (HSL-A) and Level B (HSL-B) Table 1A(3) Schedule B (NEPM 2013)

6 Based on the soil vapour intrusion Health Screening Level D (HSL-D) (NEPM 2013)

7 Reported TPH fractions do not correspond to current fractions of TRH assessed under the NEPM (2013). Soil Health Screening Levels for Direct Contact (mg/kg) (Table 4 in Friebel and Nadebaum (2011) provided as a guide only for non-volatile TPH, TPH C15-C28 as TRH >C16-C34, TPH C29-C36 as TRH >C34-C40 and volatile TPH via vapour inhalation, TPH C6-c9 compared to TRH C6-C10 and TPH C10-C14 compared to TRH >C10-C16 in sandy soils

ND Not Detected

NL Not limit (NEPM 2013)

coffey

TABLE 1 - Summary of Coffey (2006, 2007a an d2007b)'s Soil Laboratory Results and comparsion with the Health Investigation Levels

14-16 & 18-20 Orion Road, Lane Cove West

Analyte	Land use	Health Investigation Level (HIL)												Sample ID	DHA9	DHA10	DHA11	DHA12	DHA12	DHA13	DHA14	DHA14	DHA15	UTP01	UTP01	UTP01	UTP01	UTP02	UTP02	UTP02	UTP02	UTP03	DHA4	DHA5	UTP10	UTP10
		Residential HIL A (mg/kg)					Residential HIL B (mg/kg)					Commercial /industrial HIL D (mg/kg)																										
		Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake (no poultry),					Residential with minimal opportunities for soil access; includes dwellings with fully and					Commercial/industrial includes premises such as shops, offices, factories and industrial sites																										
														Geological Origin	Fill soil	Fill soil	Topsoil	Fill	Fill soil	Fill soil	Alluvium	Fill soil	soil	Fill soil	Fill soil	Fill soil	Residula soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Residual soil
														Soil Type	Sandy SILT	Gravelly SAND	Silty SAND	Sandy CLAY	Clayey SAND	Gravelly SAND	SAND	Gravelly SAND		Gravelly SAND	Gravelly SAND	Gravelly SAND	Clay	Clayey SAND	Clayey SAND	Clayey SAND	Silty SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Silty SAND	Gravelly CLAY
														Date of Sampling	2/08/07	2/08/07	30/7/07	30/7/07	30/7/07	30/7/07	30/7/07	30/7/07	30/7/07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	02-Aug-07	02-Aug-07	31-Jul-07	31-Jul-07
														Depth (m)	0.0-0.1	0.0-0.1	0.05-0.15	0.0-0.1	0.2-0.28	0.0-0.1	0.0-0.1	0.1-0.2	-	0.0-0.1	0.2-0.3	0.5-0.6	0.9-1.0	0.0-01	0.2-0.3	0.5-0.6	0.6-0.7	0.0-0.1	0.0-0.1	0.0-0.1	1.0-1.1	2.5-2.6
	Soil strata	0 m to <1m	1m to <2m	2m to <4m	>4m [5]		0 m to <1m	1m to <2m	2m to <4m	>4m [5]		0 m to <1m	1m to <2m	2m to <4m	>4m [5]	Limit of Reporting (LOR) (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
HEAVY METALS																																						
Arsenic		100				[1]	500				[2]	3000				[3]	3	<3	<3	<3	<3	<3	<3	<3	<3	3	-	-	4	-	<3	-	-	-			-	-
Cadmium		20				[1]	150				[2]	900				[3]	0.1	0.1	0.2	0.4	0.1	0.2	<0.1	<0.1	<0.1	<0.1	0.2	-	-	0.3	-	0.1	-	-	-	<3	<3	-	-
Chromium (VI)		100				[1]	500				[2]	3600				[3]	0.3	6.7	12	12	7	8.3	5.8	6.2	5	2.9	17	-	-	24	-	8.9	-	-	-	0.1	<0.1	-	-
Copper		6000				[1]	30000				[2]	17000				[3]	0.5	9.7	28	24	7.4	6.9	5.9	12	5.3	6.4	5.1	-	-	3.7	-	6.8	-	-	-	8	5.2	-	-
Nickel		400				[1]	1200				[2]	6000				[3]	0.5	3.3	16	6.7	3.3	5.6	3.3	2.8	1.8	7.1	3.2	-	-	2.8	-	7.9	-	-	-	6	53	-	-
Lead		300				[1]	1200				[2]	1500				[3]	1	15	12	23	10	10	12	14	12	3	13	-	-	12	-	9	-	-	-	3.1	3.8	-	-
Zinc		7400				[1]	60000				[2]	400000				[3]	0.3	51	65	290	44	29	33	60	26	94	22	-	-	20	-	21	-	-	-	14	8	-	-
Mercury		40				[1]	120				[2]	730				[3]	0.05	<0.05	<0.05	0.09	<0.05	<0.05	0.1	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-	-	-	34	59	-	-
TOTAL PETROLEUM HYDROCARBONS																																						
C6 - C9 Fraction		180	640	1300	2600	[7]	180	640	1300	2600	[7]	650	2800	7000	15000	[7]	20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	-	<20	-	<20	-	-	-			-	-
C10 - C14 Fraction		130	560	1200	2400	[7]	130	560	1200	2400	[7]	500	2400	NL	NL	[7]	20	<20	<20	83	<20	<20	<20	<20	<20	<20	<20	-	-	<20	-	<20	-	-	-	<20	<20	-	-
C15 - C28 Fraction		4500				[7]	5800				[7]	27000				[7]	50	<50	<50	460	<50	<50	<50	<50	<50	<50	<50	-	-	<50	-	<50	-	-	-	<20	<20	-	-
C29 - C36 Fraction		6300				[7]	8100				[7]	38000				[7]	50	56	150	830	<50	<50	<50	64	<50	<50	<50	-	-	<50	-	<50	-	-	-	<50	<50	-	-
Total C10-C36																	120	56	150	1373	ND	ND	ND	64	ND	ND	<LOR	-	-	<LOR	-	<LOR	-	-	-	58	<50	-	-
BTEX																																						
Benzene	Sand	0.5	0.5	0.5	0.5	[5]	0.5	0.5	0.5	0.5	[5]	3	3.0	3.0	3.0	[5]	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5												
	Silt	0.6	0.7	1	2	[5]	0.6	0.7	1	2	[5]	4	4	6	10	[5]											<0.5	-	-	<0.5	-	<0.5	-	-	-			-	-
	Clay	0.7	1	2	3	[5]	0.7	1	2	3	[5]	4	6	9	20	[5]		<0.5																				
Toluene	Sand	160	220	310	540	[5]	160	220	310	540	[5]	NL	NL	NL	NL	[5]	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5												
	Silt	390	NL	NL	NL	[5]	390	NL	NL	NL	[5]	NL	NL	NL	NL	[5]											<0.5	-	-	<0.5	-	<0.5	-	-	-	<0.5	<0.5	-	-
	Clay	480	NL	NL	NL	[5]	480	NL	NL	NL	[5]	NL	NL	NL	NL	[5]		<0.5																				
Ethylbenzene	Sand	55	NL	NL	NL	[5]	55	NL	NL	NL	[5]	NL	NL	NL	NL	[5]	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5												
	Silt	NL	NL	NL	NL	[5]	NL	NL	NL	NL	[5]	NL	NL	NL	NL	[5]											<0.5	-	-	<0.5	-	<0.5	-	-	-	<0.5	<0.5	-	-
	Clay	NL	NL	NL	NL	[5]	NL	NL	NL	NL	[5]	NL	NL	NL	NL	[5]																						
Total Xylene	Sand	40	60	95	170	[5]	40	60	95	170	[5]	230	NL	NL	NL	[5]	1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5												
	Silt	95	210	NL	NL	[5]	95	210	NL	NL	[5]	NL	NL	NL	NL	[5]											<1.5	-	-	<1.5	-	<1.5	-	-	-	<0.5	<0.5	-	-
	Clay	110	310	NL	NL	[5]	110	310	NL	NL	[5]	NL	NL	NL	NL	[5]																						
POLYNUCLEAR AROMATICS																																				<1.5	<1.5		
Carcinogenic PAH (as BaP TEQ)		3				[1]	4				[5]	40				[5]	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	<LOR	-	#VALUE!	-	-	-			-	-
Naphthalene	Sand	3	NL	NL	NL	[5]	NL	NL	NL	NL		NL	NL	NL	NL		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1												
	Silt	4	NL	NL	NL	[5]	NL	NL	NL	NL		NL	NL	NL	NL												<0.1	-	-	<0.1	-	<0.1	-	-	-			-	-
	Clay	5	NL	NL	NL	[5]	NL	NL	NL	NL		NL	NL	NL	NL																							
Acenaphthylene																	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	-	-	-	<0.1	<0.1	-	-
Acenaphthene																	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	-	-	-	<0.1	<0.1	-	-
Fluorene																	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	-	-	-	<0.1	<0.1	-	-
Phenanthrene																	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	-	-	-	<0.1	<0.1	-	-
Anthracene																	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	-	-	-	<0.1	<0.1	-	-
Fluoranthene																	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	-	-	-	<0.1	<0.1	-	-
Pyrene																	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	-	-	-	<0.1	<0.1	-	-
Benzo[a]anthracene																	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	-	-	-	<0.1	<0.1	-	-
Chrysene																	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	-	-	-	<0.1	<0.1	-	-
Benzo[b,k]fluoranthene																	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	-	-	-	<0.1	<0.1	-	-
Benzo(b,j)fluoranthene																	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			-	-
Benzo(k)fluoranthene																	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			-	-
Benzo[a]pyrene																	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	0.06	-	-	-	<0.05	<0.05	-	-
Indeno[123-cd]pyrene																	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	-	-	-	<0.1	<0.1	-	-
Dibenzo[ah]anthracene																	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	-	-	-	<0.1	<0.1	-	-
Benzo[ghi]perylene																	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	-	-	-	<0.1	<0.1	-	-
Total PAH's		300				[1]	400				[2]	4000				[3]	ND	<1.55	<1.55	<1.55	<1.55	<1.55	<1.55	<1.55	<1.55	<1.55	<1.55	-	-	<1.55	-	<1.56	-	-	-	<1.55	<1.55	-	-
ORGANOCHLORINE PESTICIDES																																						
DDT+DDE+DDD		240				[1]	600				[2]	3600				[3]	0.1	-	-	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-
Aldrin and dieldrin		6				[1]	10				[4]	45				[3]	0.1	-	-	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-
Chlordane		50				[1]	90				[2]	530				[3]	0.1	-	-	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-
Endosulfan		270				[1]	400				[2]	2000				[3]	0.1	-	-	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-
Endrin		10				[1]	20				[2]	100				[3]	0.1	-	-	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-
Heptachlor		6				[1]	10				[4]	50				[3]	0.1	-	-	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-
HCB		10				[1]	15				[2]	80				[3]	0.1	-	-	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-
Methoxychlor		300				[1]	500				[2]	2500				[3]	0.1	-	-	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-
Mirex		10				[1]	20				[4]	100				[3]	-										-	-	-	-	-	-	-	-	-	-	-	-	-
Toxaphene		20				[1]	30				[2]	160				[3]	-										-	-	-	-	-	-	-	-	-	-	-	-	-
POLYCHLORINATED BIPHENYLS																		-	-	ND	ND	ND	-	-	-	ND												
Total PCBs		1				[1]	1				[2]	7				[3]	0.9										<0.90	-	-	-	-	-	-	-	-	-	-	-	-
VOLATILE ORGANIC COMPOUNDS																		-	-	ND	-	-	-	-	-	-												
Total VOCs		<LOR				[4]	<LOR				[4]	<LOR				[4]	-										-	<LOR	-	-	-	-	<LOR	-	-	-	-	-	-
SEMI VOLATILE COMPOUNDS (US EPA 8270 Screen)																		-	-	ND	-	-		-	-	-												
Total SVOCs																	0.1-0.5	-	-	12	-	-	<LOR	-	-	-	-	-	-	-	<LOR	-	-	-	-	-	-	-
ASBESTOS																																						
Asbestos		Detection					Detection					Detection					-	ND	ND	-	ND	-	ND	ND	ND	ND	ND	Detected	ND	ND	ND	-	ND	Detected	ND	ND	ND	ND	ND

Notes:

Concentration exceeds the Health Investigation Level A criteria for Residential land use

Concentration exceeds the Health Investigation Level B for Residential land use

Concentration exceeds the Health Investigation Level for commercial /industrial land use

1 Based on the Health Investigation Level (HIL) A for Residential landuse of the NEPM (2013).

2 Based on the Health Investigation Level (HIL) B for Residential landuse of the NEPM (2013).

3 Based on the Health Investigation Level (HIL) D for Commercial / industrial landuse of the NEPM (2013).

4 Laboratory limit of reporting (LOR) is adopted as a preliminary health assessment criteria due to HSL not avaialble for VOC and SVOC in NEPM (1999 amended 2013)

5 Based on the soil vapour intrusion Health Screening Level A (HSL-A) and Level B (HSL-B) Table 1A(3) Schedule B (NEPM 2013)

6 Based on the soil vapour intrusion Health Screening Level D (HSL-D) (NEPM 2013)

7 Reported TPH fractions do not correspond to current fractions of TRH assessed under the NEPM (2013). Soil Health Screening Levels for Direct Contact (mg/kg) (Table 4 in Friebel and Nadebaum (2011) provided as a guide only for non-volatile TPH, TPH C15-C28 as TRH >C16-C34, TPH C29-C36 as TRH >C34-C40 and volatile TPH via vapour inhalation, TPH C6-c9 compared to TRH C6-C10 and TPH C10-C14 compared to TRH >C10-C16 in sandy soils

ND Not Detected

NL Not limit (NEPM 2013)

TABLE 1 - Summary of Coffey (2006, 2007a an d2007b)'s Soil Laboratory Results and comparsion with the Health Investigation Levels

14-16 & 18-20 Orion Road, Lane Cove West

Analyte	Land use	Health Investigation Level (HIL): Residential HIL A (mg/kg) Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake (no poultry),	Health Investigation Level (HIL): Residential HIL B (mg/kg) Residential with minimal opportunities for soil access; includes dwellings with fully and	Health Investigation Level (HIL): Commercial /industrial HIL D (mg/kg) Commercial/industrial includes premises such as shops, offices, factories and industrial sites	Sample ID	UTP11	UTP11	UTP11	UTP11	UTP11	UTP11	UTP12	UTP12	UTP12	UTP12	UTP13	UTP13	UTP13	UTP13	UTP13	UTP14	UTP14	UTP14	UTP14	UTP14	UTP15	UTP15	UTP15
					Geological Origin	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Residual soil	Topsoil	Residual soil	Residual soil	Residual soil	Fill soil	Fill soil	Fill soil	Residual soil	Residual soil	Fill soil	Fill soil	Fill soil	Residual soil	Residual soil	Fill soil	Fill soil	Residual soil
					Soil Type	Clayey SAND	Clayey SAND	Clayey SAND	Clayey SAND	Clayey SAND	Clayey SAND	Silty SAND	Clayey SAND	Clayey SAND	Clayey SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Sandy CLAY	Clayey SAND	Gravelly CLAY	Gravelly CLAY	Gravelly CLAY	Sandy CLAY	Sandy CLAY	Gravelly SAND	Gravelly SAND	Clayey SAND
					Date of Sampling	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07
					Depth (m)	0.0-0.1	0.2-0.3	0.5-0.6	0.7-0.8	1.0-1.1	2.0-2.1	0.0-0.1	0.2-0.3	0.5-0.6	1.2-1.3	0.0-0.1	0.2-0.3	0.5-0.6	1.0-1.1	1.6-1.7	0.0-0.1	0.2-0.3	0.5-0.6	1.0-1.1	1.5-1.6	0.0-0.1	0.2-0.3	0.5-0.6
	Soil strata Soil type	0 m to <1m / 1m to <2m / 2m to <4m / >4m [5]	0 m to <1m / 1m to <2m / 2m to <4m / >4m [5]	0 m to <1m / 1m to <2m / 2m to <4m / >4m [5]	Limit of Reporting (LOR) (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
HEAVY METALS																												
Arsenic		100 [1]	500 [2]	3000 [3]	3	<3	-	-	-	-	4	-	<3	-	-	<3	-	-	<3	-	-	-	3	-	-	4	-	4
Cadmium		20 [1]	150 [2]	900 [3]	0.1	0.2	-	-	-	-	0.1	-	0.1	-	-	0.1	-	-	<0.1	-	-	-	<0.1	-	-	0.3	-	<0.1
Chromium (VI)		100 [1]	500 [2]	3600 [3]	0.3	16	-	-	-	-	11	-	6.2	-	-	5.8	-	-	8.3	-	-	-	8.4	-	-	9.1	-	10
Copper		6000 [1]	30000 [2]	17000 [3]	0.5	18	-	-	-	-	0.7	-	2.8	-	-	8.3	-	-	<0.5	-	-	-	3.4	-	-	34	-	1.5
Nickel		400 [1]	1200 [2]	6000 [3]	0.5	6.2	-	-	-	-	0.5	-	1.3	-	-	4.6	-	-	0.5	-	-	-	0.8	-	-	7.4	-	0.94
Lead		300 [1]	1200 [2]	1500 [3]	1	19	-	-	-	-	5	-	8	-	-	16	-	-	4	-	-	-	7	-	-	20	-	6
Zinc		7400 [1]	60000 [2]	400000 [3]	0.3	84	-	-	-	-	2.3	-	7.9	-	-	37	-	-	5.9	-	-	-	6.3	-	-	47	-	9.3
Mercury		40 [1]	120 [2]	730 [3]	0.05	0.19	-	-	-	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	0.09	-	<0.05
TOTAL PETROLEUM HYDROCARBONS																												
C6 - C9 Fraction		180 640 1300 2600 [7]	180 640 1300 2600 [7]	650 2800 7000 15000 [7]	20	<20	-	-	-	-	<20	-	<20	-	-	<20	-	-	<20	-	-	-	<20	-	-	<20	-	<20
C10 - C14 Fraction		130 560 1200 2400 [7]	130 560 1200 2400 [7]	500 2400 NL NL [7]	20	<20	-	-	-	-	<20	-	<20	-	-	<20	-	-	<20	-	-	-	<20	-	-	<20	-	<20
C15 - C28 Fraction		4500 [7]	5800 [7]	27000 [7]	50	<50	-	-	-	-	<50	-	<50	-	-	<50	-	-	<50	-	-	-	<50	-	-	<50	-	<50
C29 - C36 Fraction		6300 [7]	8100 [7]	38000 [7]	50	<50	-	-	-	-	<50	-	<50	-	-	53	-	-	260	-	-	-	<50	-	-	<50	-	<50
Total C10-C36					120	<LOR	-	-	-	-	<LOR	-	<LOR	-	-	53	-	-	260	-	-	-	<LOR	-	-	<LOR	-	<LOR
BTEX																												
Benzene	Sand	0.5 0.5 0.5 0.5 [5]	0.5 0.5 0.5 0.5 [5]	3 3.0 3.0 3.0 [5]																								
	Silt	0.6 0.7 1 2 [5]	0.6 0.7 1 2 [5]	4 4 6 10 [5]	0.5	<0.5	-	-	-	-	<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	-	<0.5	-	-	<0.5	-	<0.5
	Clay	0.7 1 2 3 [5]	0.7 1 2 3 [5]	4 6 9 20 [5]																								
Toluene	Sand	160 220 310 540 [5]	160 220 310 540 [5]	NL NL NL NL [5]																								
	Silt	390 NL NL NL [5]	390 NL NL NL [5]	NL NL NL NL [5]	0.5	<0.5	-	-	-	-	<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	-	<0.5	-	-	<0.5	-	<0.5
	Clay	480 NL NL NL [5]	480 NL NL NL [5]	NL NL NL NL [5]																								
Ethylbenzene	Sand	55 NL NL NL [5]	55 NL NL NL [5]	NL NL NL NL [5]																								
	Silt	NL NL NL NL [5]	NL NL NL NL [5]	NL NL NL NL [5]	0.5	<0.5	-	-	-	-	<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	-	<0.5	-	-	<0.5	-	<0.5
	Clay	NL NL NL NL [5]	NL NL NL NL [5]	NL NL NL NL [5]																								
Total Xylene	Sand	40 60 95 170 [5]	40 60 95 170 [5]	230 NL NL NL [5]																								
	Silt	95 210 NL NL [5]	95 210 NL NL [5]	NL NL NL NL [5]	1.5	<1.5	-	-	-	-	<1.5	-	<1.5	-	-	<1.5	-	-	<1.5	-	-	-	<1.5	-	-	<1.5	-	<1.5
	Clay	110 310 NL NL [5]	110 310 NL NL [5]	NL NL NL NL [5]																								
POLYNUCLEAR AROMATICS																												
Carcinogenic PAH (as BaP TEQ)		3 [1]	4 [5]	40 [5]	-	<LOR	-	-	-	-	<LOR	-	<LOR	-	-	#VALUE!	-	-	<LOR	-	-	-	<LOR	-	-	0.09	-	<LOR
Naphthalene	Sand	3 NL NL NL [5]	NL NL NL NL	NL NL NL NL																								
	Silt	4 NL NL NL [5]	NL NL NL NL	NL NL NL NL	0.1	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	<0.1	-	-	<0.1	-	<0.1
	Clay	5 NL NL NL [5]	NL NL NL NL	NL NL NL NL																								
Acenaphthylene					0.1	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	0.1	-	-	<0.1	-	-	-	<0.1	-	-	<0.1	-	<0.1
Acenaphthene					0.1	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	<0.1	-	-	<0.1	-	<0.1
Fluorene					0.1	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	<0.1	-	-	<0.1	-	<0.1
Phenanthrene					0.1	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	0.8	-	-	<0.9	-	-	-	<0.1	-	-	<0.1	-	<0.1
Anthracene					0.1	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	0.2	-	-	<0.9	-	-	-	<0.1	-	-	<0.1	-	<0.1
Fluoranthene					0.1	<0.4	-	-	-	-	<0.4	-	<0.4	-	-	1.9	-	-	<0.4	-	-	-	<0.4	-	-	0.2	-	<0.1
Pyrene					0.1	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	1.7	-	-	<0.1	-	-	-	<0.1	-	-	0.2	-	<0.1
Benzo[a]anthracene					0.1	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	0.8	-	-	<0.1	-	-	-	<0.1	-	-	<0.1	-	<0.1
Chrysene					0.1	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	0.7	-	-	<0.1	-	-	-	<0.1	-	-	<0.1	-	<0.1
Benzo[b,k]fluoranthene					0.2	<0.2	-	-	-	-	<0.2	-	<0.2	-	-	1.4	-	-	<0.2	-	-	-	<0.2	-	-	<0.2	-	<0.2
Benzo(b,j)fluoranthene					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo[a]pyrene					0.05	<0.05	-	-	-	-	<0.05	-	<0.05	-	-	0.86	-	-	<0.05	-	-	-	<0.05	-	-	0.09	-	<0.05
Indeno[123-cd]pyrene					0.1	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	0.5	-	-	<0.1	-	-	-	<0.1	-	-	<0.1	-	<0.1
Dibenzo[ah]anthracene					0.1	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	0.1	-	-	<0.1	-	-	-	<0.1	-	-	<0.1	-	<0.1
Benzo[ghi]perylene					0.1	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	0.5	-	-	<0.1	-	-	-	<0.1	-	-	<0.1	-	<0.1
Total PAH's		300 [1]	400 [2]	4000 [3]	ND	<1.55	-	-	-	-	<1.55	-	<1.55	-	-	<9.86	-	-	<3.15	-	-	-	<1.55	-	-	<1.79	-	<1.55
ORGANOCHLORINE PESTICIDES																												
DDT+DDE+DDD		240 [1]	600 [2]	3600 [3]	0.1	-	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
Aldrin and dieldrin		6 [1]	10 [2]	45 [3]	0.1	-	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
Chlordane		50 [1]	90 [2]	530 [3]	0.1	-	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan		270 [1]	400 [2]	2000 [3]	0.1	-	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
Endrin		10 [1]	20 [2]	100 [3]	0.1	-	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor		6 [1]	10 [2]	50 [3]	0.1	-	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
HCB		10 [1]	15 [2]	80 [3]	0.1	-	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
Methoxychlor		300 [1]	500 [2]	2500 [3]	0.1	-	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
Mirex		10 [1]	20 [2]	100 [3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toxaphene		20 [1]	30 [2]	160 [3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
POLYCHLORINATED BIPHENYLS																												
Total PCBs		1 [1]	1 [2]	7 [3]	0.9	-	-	-	-	-	-	-	<0.90	-	-	-	-	-	<0.90	-	-	-	-	-	-	-	-	-
VOLATILE ORGANIC COMPOUNDS																												
Total VOCs		<LOR [4]	<LOR [4]	<LOR [4]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SEMI VOLATILE COMPOUNDS (US EPA 8270 Screen)																												
Total SVOCs					0.1-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ASBESTOS																												
Asbestos		Detection	Detection	Detection	-	ND	Detected	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Detected	ND	ND	ND	ND	ND	ND	ND	ND	Detected	ND

Notes:

- (green) Concentration exceeds the Health Investigation Level A criteria for Residential land use
- (yellow) Concentration exceeds the Health Investigation Level B for Residential land use
- (blue) Concentration exceeds the Health Investigation Level for commercial /industrial land use

1 Based on the Health Investigation Level (HIL) A for Residential landuse of the NEPM (2013).
2 Based on the Health Investigation Level (HIL) B for Residential landuse of the NEPM (2013).
3 Based on the Health Investigation Level (HIL) D for Commercial / industrial landuse of the NEPM (2013).

4 Laboratory limit of reporting (LOR) is adopted as a preliminary health assessment criteria due to HSL not avaialble for VOC and SVOC in NEPM (1999 amended 2013)
5 Based on the soil vapour intrusion Health Screening Level A (HSL-A) and Level B (HSL-B) Table 1A(3) Schedule B (NEPM 2013)
6 Based on the soil vapour intrusion Health Screening Level D (HSL-D) (NEPM 2013)
7 Reported TPH fractions do not correspond to current fractions of TRH assessed under the NEPM (2013). Soil Health Screening Levels for Direct Contact (mg/kg) (Table 4 in Friebel and Nadebaum (2011) provided as a guide only for non-volatile TPH, TPH C15-C28 as TRH >C16-C34, TPH C29-C36 as TRH >C34-C40 and volatile TPH via vapour inhalation, TPH C6-c9 compared to TRH C6-C10 and TPH C10-C14 compared to TRH >C10-C16 in sandy soils
ND Not Detected
NL Not limit (NEPM 2013)

coffey

TABLE 1 - Summary of Coffey (2006, 2007a an d2007b)'s Soil Laboratory Results and comparsion with the Health Investigation Levels

14-16 & 18-20 Orion Road, Lane Cove West

Analyte	Land use	Health Investigation Level (HIL)												Sample ID	UTP15	UTP16	UTP16	UTP16	UTP16	UTP16	UTP17	UTP17	UTP17	UTP17	UTP17	UTP18	UTP18	UTP18	UTP18	UTP19	UTP19	UTP19	UTP19
		Residential HIL A (mg/kg)					Residential HIL B (mg/kg)					Commercial /industrial HIL D (mg/kg)		Geological Origin	Residual soil	Fill soil	Fill soil	Fill soil	Fill soil	Residual soil	Fill soil	Fill soil	Fill soil	Fill soil	Residual	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Residual soil
		Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake (no poultry),					Residential with minimal opportunities for soil access; includes dwellings with fully and					Commercial/industrial includes premises such as shops, offices, factories and industrial sites		Soil Type	Clayey SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Sandy CLAY	Gravelly SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Clayey SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Sandy CLAY
														Date of Sampling	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07
														Depth (m)	0.9-1.0	0.0-0.1	0.2-0.3	0.5-0.6	1.0-1.1	1.3-1.4	0.0-0.1	0.2-0.3	0.5-0.6	1.0-1.1	1.6-1.9	0.0-0.1	0.2-0.3	0.5-0.6	1.0-1.1	0.0-0.1	0.2-0.3	0.5-0.6	1.0-1.1
	Soil strata Soil type	0 m to <1m	1m to <2m	2m to <4m	>4m [5]		0 m to <1m	1m to <2m	2m to <4m	>4m [5]		0 m to <1m	1m to <2m	2m to <4m	>4m [5]	Limit of Reporting (LOR) (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
HEAVY METALS																																
Arsenic		100 [1]					500 [2]					3000 [3]			3	-	-	3	-	-	7	-	-	4	-	-	<3	-	-	-	-	-	4	-
Cadmium		20 [1]					150 [2]					900 [3]			0.1	-	-	0.2	-	-	0.1	-	-	0.2	-	-	0.4	-	-	-	-	-	0.1	-
Chromium (VI)		100 [1]					500 [2]					3600 [3]			0.3	-	-	14	-	-	16	-	-	8.5	-	-	57	-	-	-	-	-	9.3	-
Copper		6000 [1]					30000 [2]					17000 [3]			0.5	-	-	13	-	-	<0.5	-	-	36	-	-	25	-	-	-	-	-	4.2	-
Nickel		400 [1]					1200 [2]					6000 [3]			0.5	-	-	8.7	-	-	0.7	-	-	8.5	-	-	69	-	-	-	-	-	2.7	-
Lead		300 [1]					1200 [2]					1500 [3]			1	-	-	19	-	-	5	-	-	25	-	-	9	-	-	-	-	-	15	-
Zinc		7400 [1]					60000 [2]					400000 [3]			0.3	-	-	48	-	-	3.2	-	-	82	-	-	58	-	-	-	-	-	17	-
Mercury		40 [1]					120 [2]					730 [3]			0.05	-	-	<0.05	-	-	<0.05	-	-	0.15	-	-	<0.05	-	-	-	-	-	<0.05	-
TOTAL PETROLEUM HYDROCARBONS																																	-
C6 - C9 Fraction		180	640	1300	2600 [7]		180	640	1300	2600 [7]		650	2800	7000	15000 [7]	20	-	-	<20	-	-	<20	-	-	<20	-	-	<20	-	-	-	-	-	<20	-
C10 - C14 Fraction		130	560	1200	2400 [7]		130	560	1200	2400 [7]		500	2400	NL	NL [7]	20	-	-	<20	-	-	<20	-	-	<20	-	-	<20	-	-	-	-	-	<20	-
C15 - C28 Fraction		4500 [7]					5800 [7]					27000 [7]			50	-	-	<50	-	-	<50	-	-	<50	-	-	<50	-	-	-	-	-	<50	-
C29 - C36 Fraction		6300 [7]					8100 [7]					38000 [7]			50	-	-	<50	-	-	<50	-	-	<50	-	-	<50	-	-	-	-	-	<50	-
Total C10-C36															120	-	-	<LOR	-	-	<LOR	-	-	<LOR	-	-	<LOR	-	-	-	-	-	<LOR	-
BTEX																																	
Benzene	Sand	0.5	0.5	0.5	0.5 [5]		0.5	0.5	0.5	0.5 [5]		3	3.0	3.0	3.0 [5]	0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	-	-	-	<0.5	-
	Silt	0.6	0.7	1	2 [5]		0.6	0.7	1	2 [5]		4	4	6	10 [5]																			
	Clay	0.7	1	2	3 [5]		0.7	1	2	3 [5]		4	6	9	20 [5]																			
Toluene	Sand	160	220	310	540 [5]		160	220	310	540 [5]		NL	NL	NL	NL [5]	0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	-	-	-	<0.5	-
	Silt	390	NL	NL	NL [5]		390	NL	NL	NL [5]		NL	NL	NL	NL [5]																			
	Clay	480	NL	NL	NL [5]		480	NL	NL	NL [5]		NL	NL	NL	NL [5]																			
Ethylbenzene	Sand	55	NL	NL	NL [5]		55	NL	NL	NL [5]		NL	NL	NL	NL [5]	0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	-	-	-	<0.5	-
	Silt	NL	NL	NL	NL [5]		NL	NL	NL	NL [5]		NL	NL	NL	NL [5]																			
	Clay	NL	NL	NL	NL [5]		NL	NL	NL	NL [5]		NL	NL	NL	NL [5]																			
Total Xylene	Sand	40	60	95	170 [5]		40	60	95	170 [5]		230	NL	NL	NL [5]	1.5	-	-	<1.5	-	-	<1.5	-	-	<1.5	-	-	<1.5	-	-	-	-	-	<1.5	-
	Silt	95	210	NL	NL [5]		95	210	NL	NL [5]		NL	NL	NL	NL [5]																			
	Clay	110	310	NL	NL [5]		110	310	NL	NL [5]		NL	NL	NL	NL [5]																			
POLYNUCLEAR AROMATICS																																	
Carcinogenic PAH (as BaP TEQ)		3 [1]					4 [2]					40 [3]			-	-	-	0.08	-	-	<LOR	-	-	0.07	-	-	<LOR	-	-	-	-	-	<LOR	-
Naphthalene	Sand	3	NL	NL	NL [5]		NL	NL	NL	NL		NL	NL	NL	NL	0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
	Silt	4	NL	NL	NL [5]		NL	NL	NL	NL		NL	NL	NL	NL																			
	Clay	5	NL	NL	NL [5]		NL	NL	NL	NL		NL	NL	NL	NL																			
Acenaphthylene																0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Acenaphthene																0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Fluorene																0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Phenanthrene																0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Anthracene																0.1	-	-	0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Fluoranthene																0.1	-	-	0.1	-	-	<0.1	-	-	0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Pyrene																0.1	-	-	<0.1	-	-	<0.1	-	-	0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Benzo[a]anthracene																0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Chrysene																0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Benzo[b,k]fluoranthene																0.2	-	-	<0.2	-	-	<0.2	-	-	<0.2	-	-	<0.2	-	-	-	-	-	<0.2	-
Benzo(b,j)fluoranthene																-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene																-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo[a]pyrene																0.05	-	-	0.08	-	-	<0.05	-	-	0.07	-	-	<0.05	-	-	-	-	-	<0.05	-
Indeno[123-cd]pyrene																0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Dibenzo[ah]anthracene																0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Benzo[ghi]perylene																0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Total PAH's		300 [1]					400 [2]					4000 [3]			ND	-	-	<1.58	-	-	<1.55	-	-	<1.57	-	-	<1.55	-	-	-	-	-	<1.55	-
ORGANOCHLORINE PESTICIDES																																	
DDT+DDE+DDD		240 [1]					600 [2]					3600 [3]			0.1	-	-	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-
Aldrin and dieldrin		6 [1]					10 [2]					45 [3]			0.1	-	-	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-
Chlordane		50 [1]					90 [2]					530 [3]			0.1	-	-	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-
Endosulfan		270 [1]					400 [2]					2000 [3]			0.1	-	-	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-
Endrin		10 [1]					20 [2]					100 [3]			0.1	-	-	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-
Heptachlor		6 [1]					10 [2]					50 [3]			0.1	-	-	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-
HCB		10 [1]					15 [2]					80 [3]			0.1	-	-	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-
Methoxychlor		300 [1]					500 [2]					2500 [3]			0.1	-	-	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-
Mirex		10 [1]					20 [2]					100 [3]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toxaphene		20 [1]					30 [2]					160 [3]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
POLYCHLORINATED BIPHENYLS																																	
Total PCBs		1 [1]					1 [2]					7 [3]			0.9	-	-	<0.90	-	-	-	-	-	-	-	-	<0.90	-	-	-	-	-	-	-
VOLATILE ORGANIC COMPOUNDS																																	-
Total VOCs		<LOR [4]					<LOR [4]					<LOR [4]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SEMI VOLATILE COMPOUNDS (US EPA 8270 Screen)																																	
Total SVOCs															0.1-0.5	-	-	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ASBESTOS																																	
Asbestos		Detection					Detection					Detection			-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

Concentration exceeds the Health Investigation Level A criteria for Residential land use

Concentration exceeds the Health Investigation Level B for Residential land use

Concentration exceeds the Health Investigation Level for commercial /industrial land use

1 Based on the Health Investigation Level (HIL) A for Residential landuse of the NEPM (2013).

2 Based on the Health Investigation Level (HIL) B for Residential landuse of the NEPM (2013).

3 Based on the Health Investigation Level (HIL) D for Commercial / industrial landuse of the NEPM (2013).

4 Laboratory limit of reporting (LOR) is adopted as a preliminary health assessment criteria due to HSL not avaialble for VOC and SVOC in NEPM (1999 amended 2013)

5 Based on the soil vapour intrusion Health Screening Level A (HSL-A) and Level B (HSL-B) Table 1A(3) Schedule B (NEPM 2013)

6 Based on the soil vapour intrusion Health Screening Level D (HSL-D) (NEPM 2013)

7 Reported TPH fractions do not correspond to current fractions of TRH assessed under the NEPM (2013). Soil Health Screening Levels for Direct Contact (mg/kg) (Table 4 in Friebel and Nadebaum (2011) provided as a guide only for non-volatile TPH, TPH C15-C28 as TRH >C16-C34, TPH C29-C36 as TRH >C34-C40 and volatile TPH via vapour inhalation, TPH C6-c9 compared to TRH C6-C10 and TPH C10-C14 compared to TRH >C10-C16 in sandy soils

ND Not Detected

NL Not limit (NEPM 2013)

TABLE 4 - Summary of Coffey (2006, 2007a and 2007b)'s Soil Laboratory Results and comparison with Ecological Investigation Levels

14-16 & 18- 20 Orion Road, Lane Cove West

Analyte	Land use	Ecological Investigation Level (EIL)				Sample ID	TP1	TP1	TP2	TP3	TP3	TP4	HA1	HA1	HA1	GRAB 1	DHA1	DHA1	DHA2	DHA2	DHA2	DHA3	DHA3	DHA4	DHA5	DHA6	DHA7	DHA8	DHA9	DHA10
		Urban residential and public open space (mg/kg)		Commercial /industrial (mg/kg)		Geological Origin	Fill	Fill	Fill	Fill	Residual	Fill	Fill	Fill	Residual	Fill	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil
		Soil Texture		Soil Texture		Soil Type	Asphalt	Gravelly Sand	Sandy Clay	Sandy Gravel	Clayey Sand	Topsoil	Silty Sand	Clayey Sand	Sand	-	Gravelly SAND	Gravelly SAND	Gravelly SAND	SAND	SAND	Silty SAND	Clayey SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Sandy SILT	Gravelly SAND
						Date of Sampling	9/11/2006	9/11/2006	9/11/2006	9/11/2006	9/11/2006	9/11/2006	9/11/2006	9/11/2006	9/11/2006	9/11/2006	30/7/07	30/7/07	30/7/07	30/7/07	30/7/07	30/7/07	30/7/07	2/08/07	2/08/07	2/08/07	2/08/07	2/08/07	2/08/07	2/08/07
						Depth (m)	0.03-0.10	1.5-1.6	0.35-0.40	1.1-1.2	1.6-1.7	0.0-0.05	0.00-0.05	0.4-0.5	0.8-0.9	-	0.0-0.1	0.2-0.3	0.0-0.1	0.2-0.3	0.4-0.5	0.0-0.05	0.1-0.2	0.0-0.1	0.0-0.1	2.4-2.5	0.0-0.1	0.0-0.2	0.0-0.1	0.0-0.1
	Soil strata Soil type	Coarse	Fine	Coarse	Fine	Limit of Reporting (LOR) (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
HEAVY METALS																														
Arsenic		56	[4]	86	[4]	3	<3	<3	6	5	<3	<3	-	9	<3	<3	3	<3	3	4	4	<3	3	<3	<3	<3	<3	<3	<3	<3
Cadmium						0.1	0.3	0.3	0.1	0.4	<0.1	0.1	-	0.4	<0.1	0.2	0.3	0.2	0.4	0.4	0.3	0.1	0.2	0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.2
Chromium (VI)		203	[4]	323	[4]	0.3	6.8	9.4	12	6.7	11	5.7	-	25	5	6.5	12	7.7	11	9.9	11	6.7	7.7	8	5.2	5.1	7	4.3	6.7	12
Copper		112	[4]	157	[4]	0.5	110	18	9.9	37	<0.5	8.4	-	50	4.1	13	20	15	56	31	25	7.4	9.3	6	53	7.8	9	3	9.7	28
Nickel		41	[4]	66	[4]	0.5	59	6.1	5.4	25	0.7	5	-	16	3.1	3.4	11	8	72	23	19.0	4.3	5.9	3.1	3.8	2.9	7.5	1.8	3.3	16
Lead		293	[4]	1163	[4]	1	4	18	16	21	5	16	-	100	13	22	32	28	5	28	27	11	22	14	8	7	12	9.5	15	12
Zinc		112	[4]	152	[4]	0.3	45	59	11	98	4.5	50	-	310	30	58	110	71	45	120	100	50	35	34	59	69	47	17	51	65
Mercury						0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	0.22	<0.05	<0.05	0.05	<0.05	<0.05	0.07	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TOTAL PETROLEUM HYDROCARBONS																														
C6 - C9 Fraction		*180*	*180* [1]	215	215 [1]	20	<20	<20	<20	<20	<20	<20	-	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
C10 - C14 Fraction		*120*	*120* [1]	170	170 [1]	20	<20	<20	<20	<20	<20	40	-	<20	<20	<20	<20	48	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
C15 - C28 Fraction		300	1300 [1]	1700	2500 [1]	50	<50	<50	<50	<50	<50	290	-	<50	<50	<50	<50	240	<50	<50	<50	79	<50	<50	<50	<50	<50	<50	<50	<50
C29 - C36 Fraction		2800	5600 [1]	3300	6600 [1]	50	<50	<50	<50	<50	<50	460	-	58	<50	<50	78	270	<50	<50	<50	290	<50	58	<50	<50	<50	<50	56	150
Total C10-C36						120	<120	<120	<120	<120	<120	790	-	58	<120	<120	78	558	ND	ND	ND	369	ND	58	ND	ND	ND	ND	56	150
BTEX																														
Benzene		50	65 [1]	75	95 [1]	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene		85	105 [1]	135	135 [1]	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene		70	125 [1]	165	185 [1]	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylene		105	45 [1]	180	95 [1]	1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	-	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
POLYNUCLEAR AROMATICS																														
Carcinogenic PAH (as BaP TEQ)						-	<LOR	-	0.06	-	<LOR	-	-	0.05	<LOR	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Naphthalene		170	[2]	370	[2]	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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene						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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene						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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene						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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene						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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene						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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene						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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene						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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo[a]anthracene						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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene						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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo[b,k]fluoranthene						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	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(b,j)fluoranthene						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo[a]pyrene		0.7	0.7 [1]	0.7	0.7 [1]	0.05	<0.05	-	0.06	-	<0.05	-	-	0.05	<0.05	-	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno[123-cd]pyrene						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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo[ah]anthracene						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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo[ghi]perylene						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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total PAH's						NA	ND	-	ND	-	ND	-	-	ND	ND	-	<1.58	<1.55	<1.55	<1.55	<1.55	<1.55	<1.55	<1.55	<1.55	<1.55	<1.55	<1.55	<1.55	<1.55
ORGANOCHLORINE PESTICIDES																														
DDT+DDE+DDD		180	[2,3]	640	[2,3]	0.1	<0.1	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	-	-
Aldrin and dieldrin						0.1	<0.1	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	-	-
Chlordane						0.1	<0.1	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	-	-
Endosulfan						0.1	<0.1	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	-	-
Endrin						0.1	<0.1	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	-	-
Heptachlor						0.1	<0.1	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	-	-
HCB						0.1	<0.1	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	-	-
Methoxychlor						0.1	<0.1	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	-	-
Mirex						-	-	-	-	-	-	-	-	-	-	-	-	-												
Toxaphene						-	-	-	-	-	-	-	-	-	-	-	-	-												
POLYCHLORINATED BIPHENYLS																	-	-	ND	-	-	-	-	-	-	-	-	ND	-	-
Total PCBs						0.9	-	-	-	<0.90	<0.90	-	-	-	-	-														
VOLATILE ORGANIC COMPOUNDS																	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl chloride						0.5	-	-	-	-	-	-	-	-	-	-							<LOR		<LOR					
SEMI VOLATILE COMPOUNDS (US EPA 8270 Screen)							-	-	<0.50	-	-	-	-	<0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total SVOCs						0.1-1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<LOR	-	<LOR	-	-	-	-
ASBESTOS							-	-	<0.50	-	-	-	-	<0.50	-	-														
Asbestos						0.00%	-	-	ND	-	-	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	-	ND	-	ND	ND	ND	ND	ND

Notes:

Concentration exceeds the Ecological Investigation Level criteria for Residential land use

Concentration exceeds the Ecological Investigation Level for commercial /industrial land use

1 Based on the Ecological Screening Level (ESL) for the corresponding landuse (Table 1B(6) of Shcedule B1 of the NEPM (2013).

2 Based on the generic Ecological Investigation Level (EIL) (Table 1B(5) - Schedule B1 of the NEPM (2013)).

3 Guideline value applicable to DDT only

4 As estimated in Table 5.1 of the report

ND Not Detected

TABLE 4 - Summary of Coffey (2006, 2007a and 2007b)'s Soil Laboratory Results and comparison with Ecological Investigation Levels

14-16 & 18- 20 Orion Road, Lane Cove West

Analyte	Land use	Ecological Investigation Level (EIL)				Sample ID	DHA11	DHA12	DHA12	DHA13	DHA14	DHA14	DHA15	UTP01	UTP01	UTP01	UTP01	UTP02	UTP02	UTP02	UTP02	UTP03	UTP03	UTP03	UTP03	UTP04	UTP04	UTP04	UTP04	UTP04
		Urban residential and public open space (mg/kg)		Commercial /industrial (mg/kg)		Geological Origin	Topsoil	Fill	Fill soil	Fill soil	Alluvium	Fill soil	soil	Fill soil	Fill soil	Fill soil	Residula soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Residual soil	Fill soil	Fill soil	Fill soil	Residual soil
		Soil Texture		Soil Texture		Soil Type	Silty SAND	Sandy CLAY	Clayey SAND	Gravelly SAND	SAND	Gravelly SAND		Gravelly SAND	Gravelly SAND	Gravelly SAND	Clay	Clayey SAND	Clayey SAND	Clayey SAND	Silty SAND	Gravelly SAND	Gravelly CLAY	Gravelly CLAY	Clayey SAND	Gravelly SAND	Clayey SAND	Gravelly SAND	Gravelly SAND	Clayey SAND
						Date of Sampling	30/7/07	30/7/07	30/7/07	30/7/07	30/7/07	30/7/07	30/7/07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07
						Depth (m)	0.05-0.15	0.0-0.1	0.2-0.28	0.0-0.1	0.0-0.1	0.1-0.2	-	0.0-0.1	0.2-0.3	0.5-0.6	0.9-1.0	0.0-01	0.2-0.3	0.5-0.6	0.6-0.7	0.0-0.1	0.2-0.3	0.5-0.6	0.9-1.0	0.0-0.1	0.2-0.3	0.5-0.6	1.0-1.1	1.4-1.5
	Soil strata Soil type	Coarse	Fine	Coarse	Fine	Limit of Reporting (LOR) (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
HEAVY METALS																														
Arsenic		56	[4]	86	[4]	3	<3	<3	<3	<3	<3	<3	<3	3	-	-	4	-	<3	-	-	-	-	4	-	-	-	4	-	4
Cadmium						0.1	0.4	0.1	0.2	<0.1	<0.1	<0.1	<0.1	0.2	-	-	0.3	-	0.1	-	-	-	-	0.1	-	-	-	0.6	-	<0.1
Chromium (VI)		203	[4]	323	[4]	0.3	12	7	8.3	5.8	6.2	5	2.9	17	-	-	24	-	8.9	-	-	-	-	9.3	-	-	-	17	-	12
Copper		112	[4]	157	[4]	0.5	24	7.4	6.9	5.9	12	5.3	6.4	5.1	-	-	3.7	-	6.8	-	-	-	-	3	-	-	-	260	-	5.4
Nickel		41	[4]	66	[4]	0.5	6.7	3.3	5.6	3.3	2.8	1.8	7.1	3.2	-	-	2.8	-	7.9	-	-	-	-	1.5	-	-	-	43	-	0.95
Lead		293	[4]	1163	[4]	1	23	10	10	12	14	12	3	13	-	-	12	-	9	-	-	-	-	13	-	-	-	74	-	9
Zinc		112	[4]	152	[4]	0.3	290	44	29	33	60	26	94	22	-	-	20	-	21	-	-	-	-	7.9	-	-	-	170	-	3.9
Mercury						0.05	0.09	<0.05	<0.05	0.1	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	<0.05	-	-	-	-	<0.05	-	-	-	0.95	-	<0.05
TOTAL PETROLEUM HYDROCARBONS																														
C6 - C9 Fraction		*180*	*180* [1]	215	215 [1]	20	<20	<20	<20	<20	<20	<20	<20	<20	-	-	<20	-	<20	-	-	-	-	<20	-	-	-	<20	-	<20
C10 - C14 Fraction		*120*	*120* [1]	170	170 [1]	20	83	<20	<20	<20	<20	<20	<20	<20	-	-	<20	-	<20	-	-	-	-	<20	-	-	-	<20	-	<20
C15 - C28 Fraction		300	1300 [1]	1700	2500 [1]	50	460	<50	<50	<50	<50	<50	<50	<50	-	-	<50	-	<50	-	-	-	-	<50	-	-	-	<50	-	<50
C29 - C36 Fraction		2800	5600 [1]	3300	6600 [1]	50	830	<50	<50	<50	64	<50	<50	<50	-	-	<50	-	<50	-	-	-	-	<50	-	-	-	<50	-	<50
Total C10-C36						120	1373	ND	ND	ND	64	ND	ND	<LOR	-	-	<LOR	-	<LOR	-	-	-	-	<LOR	-	-	-	<LOR	-	<LOR
BTEX																														
Benzene		50	65 [1]	75	95 [1]	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	-	<0.5
Toluene		85	105 [1]	135	135 [1]	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	-	<0.5
Ethylbenzene		70	125 [1]	165	185 [1]	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	-	<0.5
Total Xylene		105	45 [1]	180	95 [1]	1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	-	-	<1.5	-	<1.5	-	-	-	-	<1.5	-	-	-	<1.5	-	<1.5
POLYNUCLEAR AROMATICS																														
Carcinogenic PAH (as BaP TEQ)						-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	-	-	-	<LOR	-	0.06	-	-	-	-	<LOR	-	-	-	0.263	-	<LOR
Naphthalene		170	[2]	370	[2]	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	-	<0.1
Acenaphthylene						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	-	<0.1
Acenaphthene						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	-	<0.1
Fluorene						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	-	<0.1
Phenanthrene						0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	-	<0.1	-	-	-	-	<0.1	-	-	-	0.2	-	<0.1
Anthracene						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	-	<0.1
Fluoranthene						0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	-	<0.1	-	-	-	-	<0.1	-	-	-	0.3	-	<0.1
Pyrene						0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	-	<0.1	-	-	-	-	<0.1	-	-	-	0.3	-	<0.1
Benzo[a]anthracene						0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	-	<0.1	-	-	-	-	<0.1	-	-	-	0.2	-	<0.1
Chrysene						0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	-	<0.1	-	-	-	-	<0.1	-	-	-	0.2	-	<0.1
Benzo[b,k]fluoranthene						0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	<0.2	-	<0.2	-	-	-	-	<0.2	-	-	-	0.3	-	<0.2
Benzo(b,j)fluoranthene						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo[a]pyrene		0.7	0.7 [1]	0.7	0.7 [1]	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	-	0.06	-	-	-	-	<0.05	-	-	-	0.2	-	<0.05
Indeno[123-cd]pyrene						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	-	<0.1
Dibenzo[ah]anthracene						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	-	<0.1
Benzo[ghi]perylene						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	-	<0.1
Total PAH's						NA	<1.55	<1.55	<1.55	<1.55	<1.55	<1.55	<1.55	<1.55	-	-	<1.55	-	<1.56	-	-	-	-	<1.55	-	-	-	<2.50	-	<1.55
ORGANOCHLORINE PESTICIDES																														
DDT+DDE+DDD		180	[2,3]	640	[2,3]	0.1	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-
Aldrin and dieldrin						0.1	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-
Chlordane						0.1	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-
Endosulfan						0.1	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-
Endrin						0.1	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-
Heptachlor						0.1	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-
HCB						0.1	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-
Methoxychlor						0.1	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-
Mirex						-								-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-
Toxaphene						-								-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-
POLYCHLORINATED BIPHENYLS							ND	ND	ND	-	-	-	ND																	
Total PCBs						0.9								<0.90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOLATILE ORGANIC COMPOUNDS							ND	-	-	-	-	-	-																	
Vinyl chloride						0.5								-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-		-	-
SEMI VOLATILE COMPOUNDS (US EPA 8270 Screen)							ND	-	-	-	-	-	-																	
Total SVOCs						0.1-1.0	12	-	-	<LOR	-	-	-	-	-	-	-	-	<LOR	-	-	-	-	-	-	-	-	-	-	-
ASBESTOS																														
Asbestos						0.00%	-	ND	-	ND	ND	ND	ND	ND	Detected	ND	ND	ND	-	ND	Detected	ND	ND	ND	ND	ND	ND	Detected	ND	ND

Notes:

Concentration exceeds the Ecological Investigation Level criteria for Residential land use

Concentration exceeds the Ecological Investigation Level for commercial /industrial land use

1 Based on the Ecological Screening Level (ESL) for the corresponding landuse (Table 1B(6) of Shcedule B1 of the NEPM (2013).

2 Based on the generic Ecological Investigation Level (EIL) (Table 1B(5) - Schedule B1 of the NEPM (2013)).

3 Guideline value applicable to DDT only

4 As estimated in Table 5.1 of the report

ND Not Detected

TABLE 4 - Summary of Coffey (2006, 2007a and 2007b)'s Soil Laboratory Results and comparison with Ecological Investigation Levels

14-16 & 18- 20 Orion Road, Lane Cove West

Analyte	Land use	Ecological Investigation Level (EIL)				Sample ID	UTP04	UTP05	UTP05	UTP05	UTP05	UTP06	UTP06	UTP06	UTP07	UTP07	UTP07	UTP07	UTP07	UTP08	UTP08	UTP08	UTP08	UTP08	UTP08	UTP08	UTP09	UTP09	UTP09	UTP09	UTP09	UTP09
		Urban residential and public open space (mg/kg)		Commercial /industrial (mg/kg)		Geological Origin	Residual soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Residual soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Residual soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Residual soil
		Soil Texture		Soil Texture		Soil Type	Sandy CLAY	Gravelly SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Sandy CLAY	Gravelly SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Clayey SAND	Silty SAND	Silty SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Gravelly CLAY
						Date of Sampling	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07
						Depth (m)	2.0-2.1	0.0-0.1	0.2-0.3	0.5-0.6	1.0-1.1	0.0-0.1	0.2-0.3	0.5-0.6	0.0-0.1	0.2-0.3	0.5-0.6	1.0-1.1	2.0-2.1	0.0-0.1	0.2-0.3	0.5-0.6	1.0-1.1	1.3-1.4	2.0-2.1	2.2-2.4	0.0-0.1	0.2-0.3	0.5-0.6	1.0-1.1	2.0-2.1	3.0-3.1
	Soil strata Soil type	Coarse	Fine	Coarse	Fine	Limit of Reporting (LOR) (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
HEAVY METALS																																
Arsenic		56 [4]		86 [4]		3	-	-	3	-	-	-	5	-	4	-	5	-	-	-	5	-	-	-	-	6	4	-	-	6	-	-
Cadmium						0.1	-	-	0.1	-	-	-	0.6	-	0.3	-	0.6	-	-	-	0.2	-	-	-	-	4	0.6	-	-	0.5	-	-
Chromium (VI)		203 [4]		323 [4]		0.3	-	-	12	-	-	-	23	-	24	-	21	-	-	-	16	-	-	-	-	8.5	10	-	-	13	-	-
Copper		112 [4]		157 [4]		0.5	-	-	7.8	-	-	-	290	-	30	-	260	-	-	-	18	-	-	-	-	9.9	210	-	-	160	-	-
Nickel		41 [4]		66 [4]		0.5	-	-	8.3	-	-	-	43	-	26	-	40	-	-	-	11	-	-	-	-	4.1	21	-	-	35	-	-
Lead		293 [4]		1163 [4]		1	-	-	13	-	-	-	80	-	59	-	81	-	-	-	15	-	-	-	-	14	48	-	-	53	-	-
Zinc		112 [4]		152 [4]		0.3	-	-	76	-	-	-	150	-	82	-	220	-	-	-	92	-	-	-	-	27	51	-	-	99	-	-
Mercury						0.05	-	-	<0.05	-	-	-	0.93	-	0.12	-	0.72	-	-	-	<0.05	-	-	-	-	<0.05	0.31	-	-	0.45	-	-
TOTAL PETROLEUM HYDROCARBONS																																
C6 - C9 Fraction		*180*	*180* [1]	215	215 [1]	20	-	-	<20	-	-	-	<20	-	<20	-	<20	-	-	-	<20	-	-	-	-	<20	<20	-	-	<20	-	-
C10 - C14 Fraction		*120*	*120* [1]	170	170 [1]	20	-	-	<20	-	-	-	<20	-	<20	-	<20	-	-	-	<20	-	-	-	-	<20	<20	-	-	<20	-	-
C15 - C28 Fraction		300	1300 [1]	1700	2500 [1]	50	-	-	<50	-	-	-	<50	-	<50	-	<50	-	-	-	<50	-	-	-	-	<50	<50	-	-	<50	-	-
C29 - C36 Fraction		2800	5600 [1]	3300	6600 [1]	50	-	-	<50	-	-	-	<50	-	70	-	<50	-	-	-	<50	-	-	-	-	<50	<50	-	-	<50	-	-
Total C10-C36						120	-	-	<LOR	-	-	-	<LOR	-	70	-	<LOR	-	-	-	<LOR	-	-	-	-	<LOR	<LOR	-	-	<LOR	-	-
BTEX																																
Benzene		50	65 [1]	75	95 [1]	0.5	-	-	<0.5	-	-	-	<0.5	-	<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5	-	-
Toluene		85	105 [1]	135	135 [1]	0.5	-	-	<0.5	-	-	-	<0.5	-	<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5	-	-
Ethylbenzene		70	125 [1]	165	185 [1]	0.5	-	-	<0.5	-	-	-	<0.5	-	<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-	-	<0.5	-	-
Total Xylene		105	45 [1]	180	95 [1]	1.5	-	-	<1.5	-	-	-	<1.5	-	<1.5	-	<1.5	-	-	-	<1.5	-	-	-	-	<1.5	<1.5	-	-	<1.5	-	-
POLYNUCLEAR AROMATICS																																
Carcinogenic PAH (as BaP TEQ)						-	-	-	<LOR	-	-	-	0.293	-	<LOR	-	0.313	-	-	-	0.6	-	-	-	-	<LOR	0.364	-	-	0.617	-	-
Naphthalene		170 [2]		370 [2]		0.1	-	-	<0.1	-	-	-	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1	-	-
Acenaphthylene						0.1	-	-	<0.1	-	-	-	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1	-	-
Acenaphthene						0.1	-	-	<0.1	-	-	-	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1	-	-
Fluorene						0.1	-	-	<0.1	-	-	-	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1	-	-
Phenanthrene						0.1	-	-	<0.1	-	-	-	0.2	-	<0.1	-	0.2	-	-	-	<0.1	-	-	-	-	<0.1	0.2	-	-	0.3	-	-
Anthracene						0.1	-	-	<0.1	-	-	-	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1	-	-
Fluoranthene						0.1	-	-	<0.1	-	-	-	0.3	-	<0.1	-	0.4	-	-	-	<0.1	-	-	-	-	<0.1	0.4	-	-	0.8	-	-
Pyrene						0.1	-	-	<0.1	-	-	-	0.3	-	<0.1	-	0.4	-	-	-	<0.1	-	-	-	-	<0.1	0.4	-	-	0.8	-	-
Benzo[a]anthracene						0.1	-	-	<0.1	-	-	-	0.2	-	<0.1	-	0.3	-	-	-	<0.1	-	-	-	-	<0.1	0.3	-	-	0.5	-	-
Chrysene						0.1	-	-	<0.1	-	-	-	0.2	-	<0.1	-	0.2	-	-	-	<0.1	-	-	-	-	<0.1	0.2	-	-	0.4	-	-
Benzo[b,k]fluoranthene						0.2	-	-	<0.2	-	-	-	0.4	-	<0.2	-	0.4	-	-	-	<0.2	-	-	-	-	<0.2	0.4	-	-	0.7	-	-
Benzo(b,j)fluoranthene						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo[a]pyrene		0.7	0.7 [1]	0.7	0.7 [1]	0.05	-	-	<0.05	-	-	-	0.22	-	<0.05	-	0.23	-	-	-	0.6	-	-	-	-	<0.05	0.27	-	-	0.46	-	-
Indeno[123-cd]pyrene						0.1	-	-	<0.1	-	-	-	0.1	-	<0.1	-	0.1	-	-	-	<0.1	-	-	-	-	<0.1	0.2	-	-	0.3	-	-
Dibenzo[ah]anthracene						0.1	-	-	<0.1	-	-	-	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	<0.1	-	-
Benzo[ghi]perylene						0.1	-	-	<0.1	-	-	-	0.1	-	<0.1	-	0.1	-	-	-	<0.1	-	-	-	-	<0.1	0.2	-	-	0.3	-	-
Total PAH's						NA	-	-	<1.55	-	-	-	<2.62	-	<1.65	-	<2.93	-	-	-	<1.56	-	-	-	-	<1.55	<3.17	-	-	<5.16	-	-
ORGANOCHLORINE PESTICIDES																																
DDT+DDE+DDD		180 [2,3]		640 [2,3]		0.1	-	-	-	-	-	-		-	<0.1	-	-	-	-	-	<0.1	-	-	-	-	-	<0.1	-	-	-	-	-
Aldrin and dieldrin						0.1	-	-	-	-	-	-		-	<0.1	-	-	-	-	-	<0.1	-	-	-	-	-	<0.1	-	-	-	-	-
Chlordane						0.1	-	-	-	-	-	-		-	<0.1	-	-	-	-	-	<0.1	-	-	-	-	-	<0.1	-	-	-	-	-
Endosulfan						0.1	-	-	-	-	-	-		-	<0.1	-	-	-	-	-	<0.1	-	-	-	-	-	<0.1	-	-	-	-	-
Endrin						0.1	-	-	-	-	-	-		-	<0.1	-	-	-	-	-	<0.1	-	-	-	-	-	<0.1	-	-	-	-	-
Heptachlor						0.1	-	-	-	-	-	-		-	<0.1	-	-	-	-	-	<0.1	-	-	-	-	-	<0.1	-	-	-	-	-
HCB						0.1	-	-	-	-	-	-		-	<0.1	-	-	-	-	-	<0.1	-	-	-	-	-	<0.1	-	-	-	-	-
Methoxychlor						0.1	-	-	-	-	-	-		-	<0.1	-	-	-	-	-	<0.1	-	-	-	-	-	<0.1	-	-	-	-	-
Mirex						-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toxaphene						-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
POLYCHLORINATED BIPHENYLS																																
Total PCBs						0.9	-	-	-	-	-	-	<0.90	-	-	-	-	-	-	-	<0.90	-	-	-	-	-	<0.90	-	-	-	-	-
VOLATILE ORGANIC COMPOUNDS																																
Vinyl chloride						0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-
SEMI VOLATILE COMPOUNDS (US EPA 8270 Screen)																																
Total SVOCs						0.1-1.0	-	-	-	-	-	-	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ASBESTOS																																
Asbestos						0.00%	ND	ND	ND	ND	ND	ND	ND	ND	ND	Detected	Detected	ND	ND	ND	ND	Detected	Detected	ND	ND	ND	ND	ND	ND	ND	ND	Detected

Notes:

Concentration exceeds the Ecological Investigation Level criteria for Residential land use

Concentration exceeds the Ecological Investigation Level for commercial /industrial land use

1 Based on the Ecological Screening Level (ESL) for the corresponding landuse (Table 1B(6) of Shcedule B1 of the NEPM (2013).

2 Based on the generic Ecological Investigation Level (EIL) (Table 1B(5) - Schedule B1 of the NEPM (2013)).

3 Guideline value applicable to DDT only

4 As estimated in Table 5.1 of the report

ND Not Detected

TABLE 4 - Summary of Coffey (2006, 2007a and 2007b)'s Soil Laboratory Results and comparison with Ecological Investigation Levels

14-16 & 18- 20 Orion Road, Lane Cove West

Analyte	Land use	Ecological Investigation Level (EIL)				Sample ID	UTP10	UTP10	UTP10	UTP10	UTP10	UTP11	UTP11	UTP11	UTP11	UTP11	UTP11	UTP12	UTP12	UTP12	UTP12	UTP13	UTP13	UTP13	UTP13	UTP13	UTP14	UTP14	UTP14	UTP14	UTP14	UTP15
		Urban residential and public open space (mg/kg)		Commercial /industrial (mg/kg)		Geological Origin	Fill soil	Fill soil	Fill soil	Fill soil	Residual soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Residual soil	Topsoil	Residual soil	Residual soil	Residual soil	Fill soil	Fill soil	Fill soil	Residual soil	Residual soil	Fill soil	Fill soil	Fill soil	Residual soil	Residual soil	Fill soil
		Soil Texture		Soil Texture		Soil Type	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Gravelly CLAY	Clayey SAND	Clayey SAND	Clayey SAND	Clayey SAND	Clayey SAND	Clayey SAND	Silty SAND	Clayey SAND	Clayey SAND	Clayey SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Sandy CLAY	Clayey SAND	Gravelly CLAY	Gravelly CLAY	Gravelly CLAY	Sandy CLAY	Sandy CLAY	Gravelly SAND
						Date of Sampling	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	31-Jul-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07
						Depth (m)	0.0-0.1	0.2-0.3	0.5-0.6	1.0-1.1	2.5-2.6	0.0-0.1	0.2-0.3	0.5-0.6	0.7-0.8	1.0-1.1	2.0-2.1	0.0-0.1	0.2-0.3	0.5-0.6	1.2-1.3	0.0-0.1	0.2-0.3	0.5-0.6	1.0-1.1	1.6-1.7	0.0-0.1	0.2-0.3	0.5-0.6	1.0-1.1	1.5-1.6	0.0-0.1
	Soil strata Soil type	Coarse	Fine	Coarse	Fine	Limit of Reporting (LOR) (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
HEAVY METALS																																
Arsenic		56 [4]		86 [4]		3	-	-	5	-	-	<3	-	-	-	-	4	-	<3	-	-	<3	-	-	<3	-	-	-	3	-	-	4
Cadmium						0.1	-	-	0.6	-	-	0.2	-	-	-	-	0.1	-	0.1	-	-	0.1	-	-	<0.1	-	-	-	<0.1	-	-	0.3
Chromium (VI)		203 [4]		323 [4]		0.3	-	-	16	-	-	16	-	-	-	-	11	-	6.2	-	-	5.8	-	-	8.3	-	-	-	8.4	-	-	9.1
Copper		112 [4]		157 [4]		0.5	-	-	270	-	-	18	-	-	-	-	0.7	-	2.8	-	-	8.3	-	-	<0.5	-	-	-	3.4	-	-	34
Nickel		41 [4]		66 [4]		0.5	-	-	46	-	-	6.2	-	-	-	-	0.5	-	1.3	-	-	4.6	-	-	0.5	-	-	-	0.8	-	-	7.4
Lead		293 [4]		1163 [4]		1	-	-	81	-	-	19	-	-	-	-	5	-	8	-	-	16	-	-	4	-	-	-	7	-	-	20
Zinc		112 [4]		152 [4]		0.3	-	-	140	-	-	84	-	-	-	-	2.3	-	7.9	-	-	37	-	-	5.9	-	-	-	6.3	-	-	47
Mercury						0.05	-	-	0.96	-	-	0.19	-	-	-	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	0.09
TOTAL PETROLEUM HYDROCARBONS																																
C6 - C9 Fraction		*180*	*180* [1]	215	215 [1]	20	-	-	<20	-	-	<20	-	-	-	-	<20	-	<20	-	-	<20	-	-	<20	-	-	-	<20	-	-	<20
C10 - C14 Fraction		*120*	*120* [1]	170	170 [1]	20	-	-	<20	-	-	<20	-	-	-	-	<20	-	<20	-	-	<20	-	-	<20	-	-	-	<20	-	-	<20
C15 - C28 Fraction		300	1300 [1]	1700	2500 [1]	50	-	-	77	-	-	<50	-	-	-	-	<50	-	<50	-	-	<50	-	-	<50	-	-	-	<50	-	-	<50
C29 - C36 Fraction		2800	5600 [1]	3300	6600 [1]	50	-	-	<50	-	-	<50	-	-	-	-	<50	-	<50	-	-	53	-	-	260	-	-	-	<50	-	-	<50
Total C10-C36						120	-	-	77	-	-	<LOR	-	-	-	-	<LOR	-	<LOR	-	-	53	-	-	260	-	-	-	<LOR	-	-	<LOR
BTEX																																
Benzene		50	65 [1]	75	95 [1]	0.5	-	-	<0.5	-	-	<0.5	-	-	-	-	<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	-	<0.5	-	-	<0.5
Toluene		85	105 [1]	135	135 [1]	0.5	-	-	<0.5	-	-	<0.5	-	-	-	-	<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	-	<0.5	-	-	<0.5
Ethylbenzene		70	125 [1]	165	185 [1]	0.5	-	-	<0.5	-	-	<0.5	-	-	-	-	<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	-	<0.5	-	-	<0.5
Total Xylene		105	45 [1]	180	95 [1]	1.5	-	-	<1.5	-	-	<1.5	-	-	-	-	<1.5	-	<1.5	-	-	<1.5	-	-	<1.5	-	-	-	<1.5	-	-	<1.5
POLYNUCLEAR AROMATICS																																
Carcinogenic PAH (as BaP TEQ)						-	-	-	0.506	-	-	<LOR	-	-	-	-	<LOR	-	<LOR	-	-	1.242	-	-	<LOR	-	-	-	<LOR	-	-	0.09
Naphthalene		170 [2]		370 [2]		0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	<0.1	-	-	<0.1
Acenaphthylene						0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	0.1	-	-	<0.1	-	-	-	<0.1	-	-	<0.1
Acenaphthene						0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	<0.1	-	-	<0.1
Fluorene						0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	<0.1	-	-	<0.1
Phenanthrene						0.1	-	-	0.2	-	-	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	0.8	-	-	<0.9	-	-	-	<0.1	-	-	<0.1
Anthracene						0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	0.2	-	-	<0.9	-	-	-	<0.1	-	-	<0.1
Fluoranthene						0.1	-	-	0.6	-	-	<0.4	-	-	-	-	<0.4	-	<0.4	-	-	1.9	-	-	<0.4	-	-	-	<0.4	-	-	0.2
Pyrene						0.1	-	-	0.7	-	-	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	1.7	-	-	<0.1	-	-	-	<0.1	-	-	0.2
Benzo[a]anthracene						0.1	-	-	0.4	-	-	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	0.8	-	-	<0.1	-	-	-	<0.1	-	-	<0.1
Chrysene						0.1	-	-	0.3	-	-	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	0.7	-	-	<0.1	-	-	-	<0.1	-	-	<0.1
Benzo[b,k]fluoranthene						0.2	-	-	0.6	-	-	<0.2	-	-	-	-	<0.2	-	<0.2	-	-	1.4	-	-	<0.2	-	-	-	<0.2	-	-	<0.2
Benzo(b,j)fluoranthene						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo[a]pyrene		0.7	0.7 [1]	0.7	0.7 [1]	0.05	-	-	0.38	-	-	<0.05	-	-	-	-	<0.05	-	<0.05	-	-	0.86	-	-	<0.05	-	-	-	<0.05	-	-	0.09
Indeno[123-cd]pyrene						0.1	-	-	0.2	-	-	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	0.5	-	-	<0.1	-	-	-	<0.1	-	-	<0.1
Dibenzo[ah]anthracene						0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	0.1	-	-	<0.1	-	-	-	<0.1	-	-	<0.1
Benzo[ghi]perylene						0.1	-	-	0.3	-	-	<0.1	-	-	-	-	<0.1	-	<0.1	-	-	0.5	-	-	<0.1	-	-	-	<0.1	-	-	<0.1
Total PAH's						NA	-	-	<4.28	-	-	<1.55	-	-	-	-	<1.55	-	<1.55	-	-	<9.86	-	-	<3.15	-	-	-	<1.55	-	-	<1.79
ORGANOCHLORINE PESTICIDES																																
DDT+DDE+DDD		180 [2,3]		640 [2,3]		0.1	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-
Aldrin and dieldrin						0.1	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-
Chlordane						0.1	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-
Endosulfan						0.1	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-
Endrin						0.1	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-
Heptachlor						0.1	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-
HCB						0.1	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-
Methoxychlor						0.1	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-
Mirex						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toxaphene						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
POLYCHLORINATED BIPHENYLS																																
Total PCBs						0.9	-	-	-	-	-	-	-	-	-	-	-	-	<0.90	-	-	-	-	-	<0.90	-	-	-	-	-	-	-	-
VOLATILE ORGANIC COMPOUNDS																																
Vinyl chloride						0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SEMI VOLATILE COMPOUNDS (US EPA 8270 Screen)																																
Total SVOCs						0.1-1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ASBESTOS																																
Asbestos						0.00%	ND	ND	ND	ND	ND	ND	Detected	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Detected	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

Concentration exceeds the Ecological Investigation Level criteria for Residential land use

Concentration exceeds the Ecological Investigation Level for commercial /industrial land use

1 Based on the Ecological Screening Level (ESL) for the corresponding landuse (Table 1B(6) of Shcedule B1 of the NEPM (2013).

2 Based on the generic Ecological Investigation Level (EIL) (Table 1B(5) - Schedule B1 of the NEPM (2013)).

3 Guideline value applicable to DDT only

4 As estimated in Table 5.1 of the report

ND Not Detected

TABLE 4 - Summary of Coffey (2006, 2007a and 2007b)'s Soil Laboratory Results and comparison with Ecological Investigation Levels

14-16 & 18- 20 Orion Road, Lane Cove West

Analyte	Land use	Ecological Investigation Level (EIL)				Sample ID	UTP15	UTP15	UTP15	UTP16	UTP16	UTP16	UTP16	UTP16	UTP17	UTP17	UTP17	UTP17	UTP17	UTP18	UTP18	UTP18	UTP18	UTP19	UTP19	UTP19	UTP19
		Urban residential and public open space (mg/kg)		Commercial /industrial (mg/kg)		Geological Origin	Fill soil	Residual soil	Residual soil	Fill soil	Fill soil	Fill soil	Fill soil	Residual soil	Fill soil	Fill soil	Fill soil	Fill soil	Residual	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Fill soil	Residual soil
		Soil Texture		Soil Texture		Soil Type	Gravelly SAND	Clayey SAND	Clayey SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Sandy CLAY	Gravelly SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Clayey SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Sandy CLAY
						Date of Sampling	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07	1-Aug-07
						Depth (m)	0.2-0.3	0.5-0.6	0.9-1.0	0.0-0.1	0.2-0.3	0.5-0.6	1.0-1.1	1.3-1.4	0.0-0.1	0.2-0.3	0.5-0.6	1.0-1.1	1.6-1.9	0.0-0.1	0.2-0.3	0.5-0.6	1.0-1.1	0.0-0.1	0.2-0.3	0.5-0.6	1.0-1.1
	Soil strata Soil type	Coarse	Fine	Coarse	Fine	Limit of Reporting (LOR) (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
HEAVY METALS																											
Arsenic		56 [4]		86 [4]		3	-	4	-	-	3	-	-	7	-	-	4	-	-	<3	-	-	-	-	-	4	-
Cadmium						0.1	-	<0.1	-	-	0.2	-	-	0.1	-	-	0.2	-	-	0.4	-	-	-	-	-	0.1	-
Chromium (VI)		203 [4]		323 [4]		0.3	-	10	-	-	14	-	-	16	-	-	8.5	-	-	57	-	-	-	-	-	9.3	-
Copper		112 [4]		157 [4]		0.5	-	1.5	-	-	13	-	-	<0.5	-	-	36	-	-	25	-	-	-	-	-	4.2	-
Nickel		41 [4]		66 [4]		0.5	-	0.94	-	-	8.7	-	-	0.7	-	-	8.5	-	-	69	-	-	-	-	-	2.7	-
Lead		293 [4]		1163 [4]		1	-	6	-	-	19	-	-	5	-	-	25	-	-	9	-	-	-	-	-	15	-
Zinc		112 [4]		152 [4]		0.3	-	9.3	-	-	48	-	-	3.2	-	-	82	-	-	58	-	-	-	-	-	17	-
Mercury						0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	0.15	-	-	<0.05	-	-	-	-	-	<0.05	-
TOTAL PETROLEUM HYDROCARBONS																											-
C6 - C9 Fraction		*180*	*180* [1]	215	215 [1]	20	-	<20	-	-	<20	-	-	<20	-	-	<20	-	-	<20	-	-	-	-	-	<20	-
C10 - C14 Fraction		*120*	*120* [1]	170	170 [1]	20	-	<20	-	-	<20	-	-	<20	-	-	<20	-	-	<20	-	-	-	-	-	<20	-
C15 - C28 Fraction		300	1300 [1]	1700	2500 [1]	50	-	<50	-	-	<50	-	-	<50	-	-	<50	-	-	<50	-	-	-	-	-	<50	-
C29 - C36 Fraction		2800	5600 [1]	3300	6600 [1]	50	-	<50	-	-	<50	-	-	<50	-	-	<50	-	-	<50	-	-	-	-	-	<50	-
Total C10-C36						120	-	<LOR	-	-	<LOR	-	-	<LOR	-	-	<LOR	-	-	<LOR	-	-	-	-	-	<LOR	-
BTEX																											
Benzene		50	65 [1]	75	95 [1]	0.5	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	-	-	-	<0.5	-
Toluene		85	105 [1]	135	135 [1]	0.5	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	-	-	-	<0.5	-
Ethylbenzene		70	125 [1]	165	185 [1]	0.5	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	-	-	-	<0.5	-
Total Xylene		105	45 [1]	180	95 [1]	1.5	-	<1.5	-	-	<1.5	-	-	<1.5	-	-	<1.5	-	-	<1.5	-	-	-	-	-	<1.5	-
POLYNUCLEAR AROMATICS																											
Carcinogenic PAH (as BaP TEQ)						-	-	<LOR	-	-	0.08	-	-	<LOR	-	-	0.07	-	-	<LOR	-	-	-	-	-	<LOR	-
Naphthalene		170 [2]		370 [2]		0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Acenaphthylene						0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Acenaphthene						0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Fluorene						0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Phenanthrene						0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Anthracene						0.1	-	<0.1	-	-	0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Fluoranthene						0.1	-	<0.1	-	-	0.1	-	-	<0.1	-	-	0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Pyrene						0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Benzo[a]anthracene						0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Chrysene						0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Benzo[b,k]fluoranthene						0.2	-	<0.2	-	-	<0.2	-	-	<0.2	-	-	<0.2	-	-	<0.2	-	-	-	-	-	<0.2	-
Benzo(b,j)fluoranthene						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo[a]pyrene		0.7	0.7 [1]	0.7	0.7 [1]	0.05	-	<0.05	-	-	0.08	-	-	<0.05	-	-	0.07	-	-	<0.05	-	-	-	-	-	<0.05	-
Indeno[123-cd]pyrene						0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Dibenzo[ah]anthracene						0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Benzo[ghi]perylene						0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Total PAH's						NA	-	<1.55	-	-	<1.58	-	-	<1.55	-	-	<1.57	-	-	<1.55	-	-	-	-	-	<1.55	-
ORGANOCHLORINE PESTICIDES																											
DDT+DDE+DDD		180 [2,3]		640 [2,3]		0.1	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-
Aldrin and dieldrin						0.1	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-
Chlordane						0.1	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-
Endosulfan						0.1	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-
Endrin						0.1	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-
Heptachlor						0.1	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-
HCB						0.1	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-
Methoxychlor						0.1	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-
Mirex						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toxaphene						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
POLYCHLORINATED BIPHENYLS																											
Total PCBs						0.9	-	-	-	-	<0.90	-	-	-	-	-	-	-	-	<0.90	-	-	-	-	-	-	-
VOLATILE ORGANIC COMPOUNDS																											-
Vinyl chloride						0.5	-	-	-	-	<0.5	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	<0.5	-
SEMI VOLATILE COMPOUNDS (US EPA 8270 Screen)																											
Total SVOCs						0.1-1.0	-	-	-	-	<LOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ASBESTOS																											
Asbestos						0.00%	Detected	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

Concentration exceeds the Ecological Investigation Level criteria for Residential land use

Concentration exceeds the Ecological Investigation Level for commercial /industrial land use

1 Based on the Ecological Screening Level (ESL) for the corresponding landuse (Table 1B(6) of Shcedule B1 of the NEPM (2013).

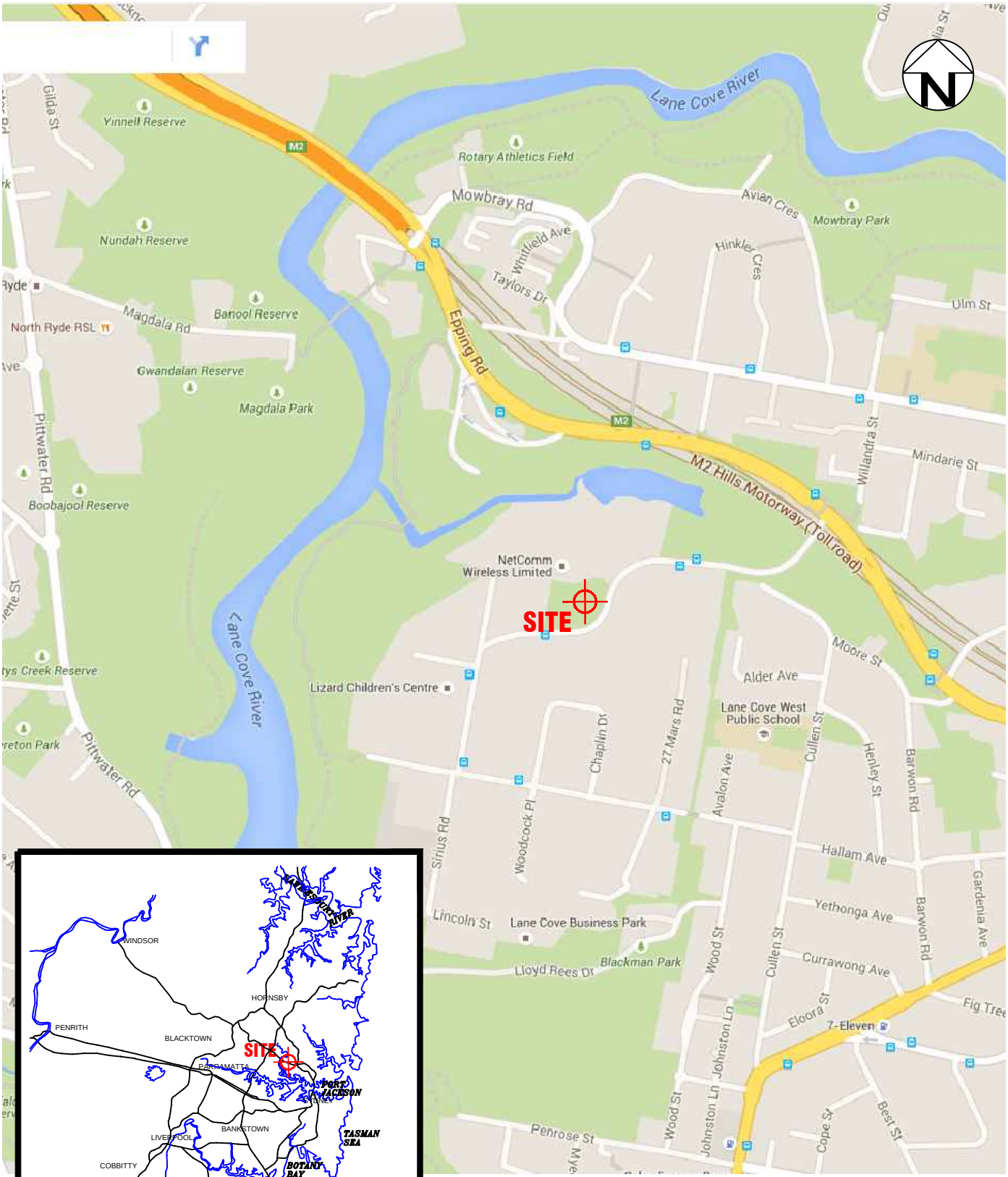
2 Based on the generic Ecological Investigation Level (EIL) (Table 1B(5) - Schedule B1 of the NEPM (2013)).

3 Guideline value applicable to DDT only

4 As estimated in Table 5.1 of the report

ND Not Detected

Figures



AERIAL IMAGE SOURCE: GOOGLE EARTH PRO 7.1.2.2041
AERIAL IMAGE ©: IMAGE @ 2014 DIGITALGLOBE

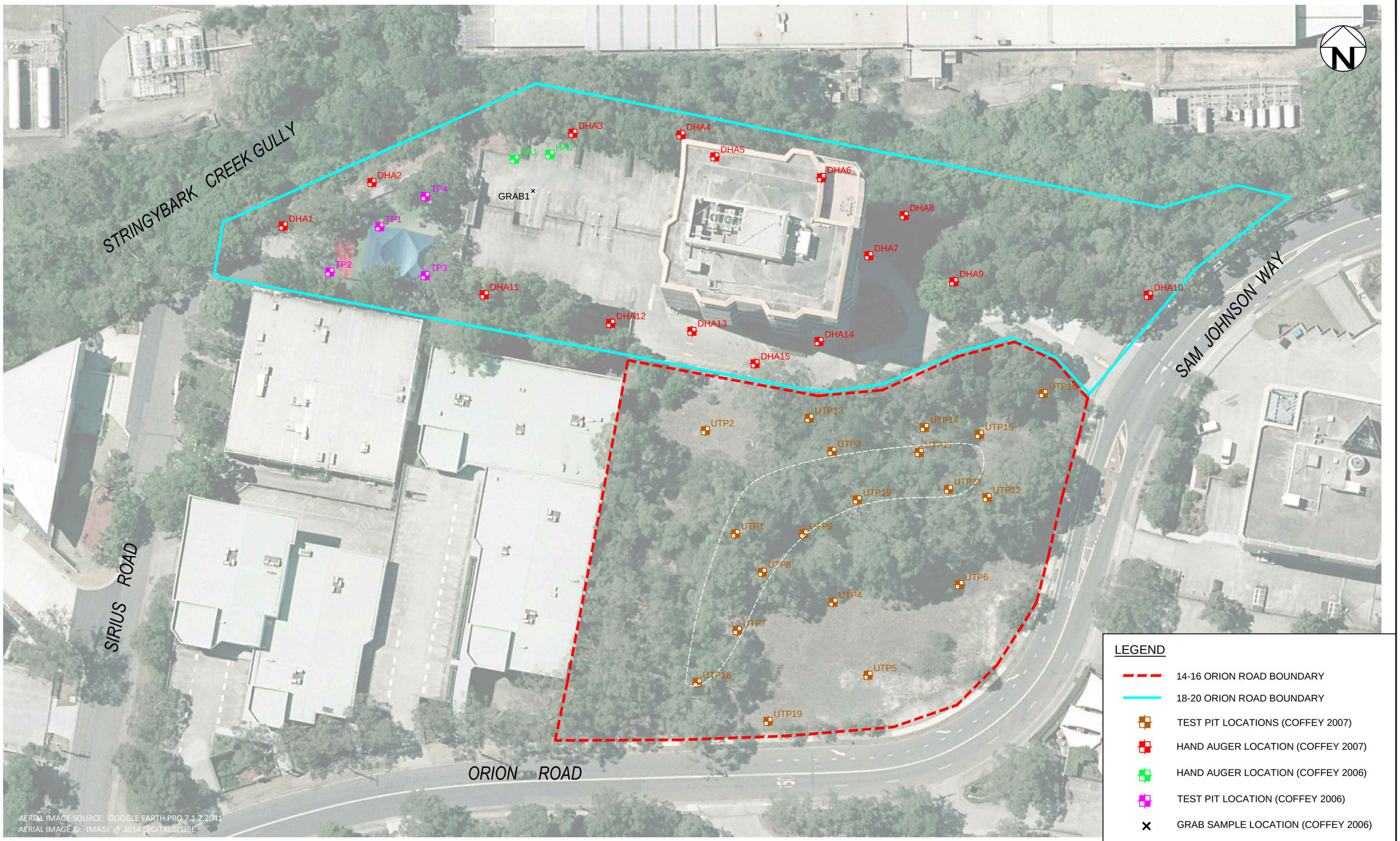
drawn	MV
approved	ACM
date	11/06/15
scale	NTS
original size	A4

coffey

client:	DEVELCO PTY LTD
project:	ENVIRONMENTAL REVIEW OF 14-16 AND 18-20 ORION ROAD LANE COVE WEST, NSW
title:	SITE LOCATION PLAN

project no:	figure no:	rev:
ENAURHOD04594AB-R01	FIGURE 1	A

PLOT DATE: 11/06/2015 8:35:23 PM DWG FILE: \\CHATFS01.CORP.COFFEY.COM.AU\DATA\$\ENV\PROJECTS\ENAURHOD\ENAURHOD04 GOVIND\ENAURHOD04500-04599\ENAURHOD04594 DUCRU LANE COVE WEST\ENAURHOD04594AB ENVIRONMENTAL REVIEW\DRAFTING\ENAURHOD04594AB.DWG



LEGEND

- 14-16 ORION ROAD BOUNDARY
- 18-20 ORION ROAD BOUNDARY
- TEST PIT LOCATIONS (COFFEY 2007)
- HAND AUGER LOCATION (COFFEY 2007)
- HAND AUGER LOCATION (COFFEY 2006)
- TEST PIT LOCATION (COFFEY 2006)
- GRAB SAMPLE LOCATION (COFFEY 2006)

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE			

NOTE:
ALL LOCATIONS ARE APPROXIMATE
DIMENSIONS IN METRES.

8 0 8 24 40

Scale (metres) 1:800

drawn	MV
approved	ACM
date	11/06/15
scale	AS SHOWN
original size	A3

coffey

client: DEVELCO PTY LTD

project: ENVIRONMENTAL REVIEW OF 14-16 AND 18-20 ORION ROAD LANE COVE WEST, NSW

title: SITE LAYOUT AND LOCATIONS OF PREVIOUS INVESTIGATIONS

project no: ENAURHOD04594AB-R01 | figure no: FIGURE 2 | rev: A

PLOT DATE: 11/06/2015 8:30:18 PM DWG FILE: \\CHATFS01.CORP.COFFEY.COM.AU\DATA$\ENV\PROJECTS\ENAURHOD\ENAURHOD04 GOVN\DI\ENAURHOD04500-04599\ENAURHOD04594 DUCRU LANE COVE WEST\ENAURHOD04594AB ENVIRONMENTAL REVIEW\DRAFTING\ENAURHOD04594AB.DWG

2008

LEGEND

14-16 ORION ROAD BOUNDARY

18-20 ORION ROAD BOUNDARY

20 0 20 40 60 80

Scale (metres) 1:1500

drawn	MV
approved	ACM
date	11/06/15
scale	AS SHOWN
original size	A4

coffey

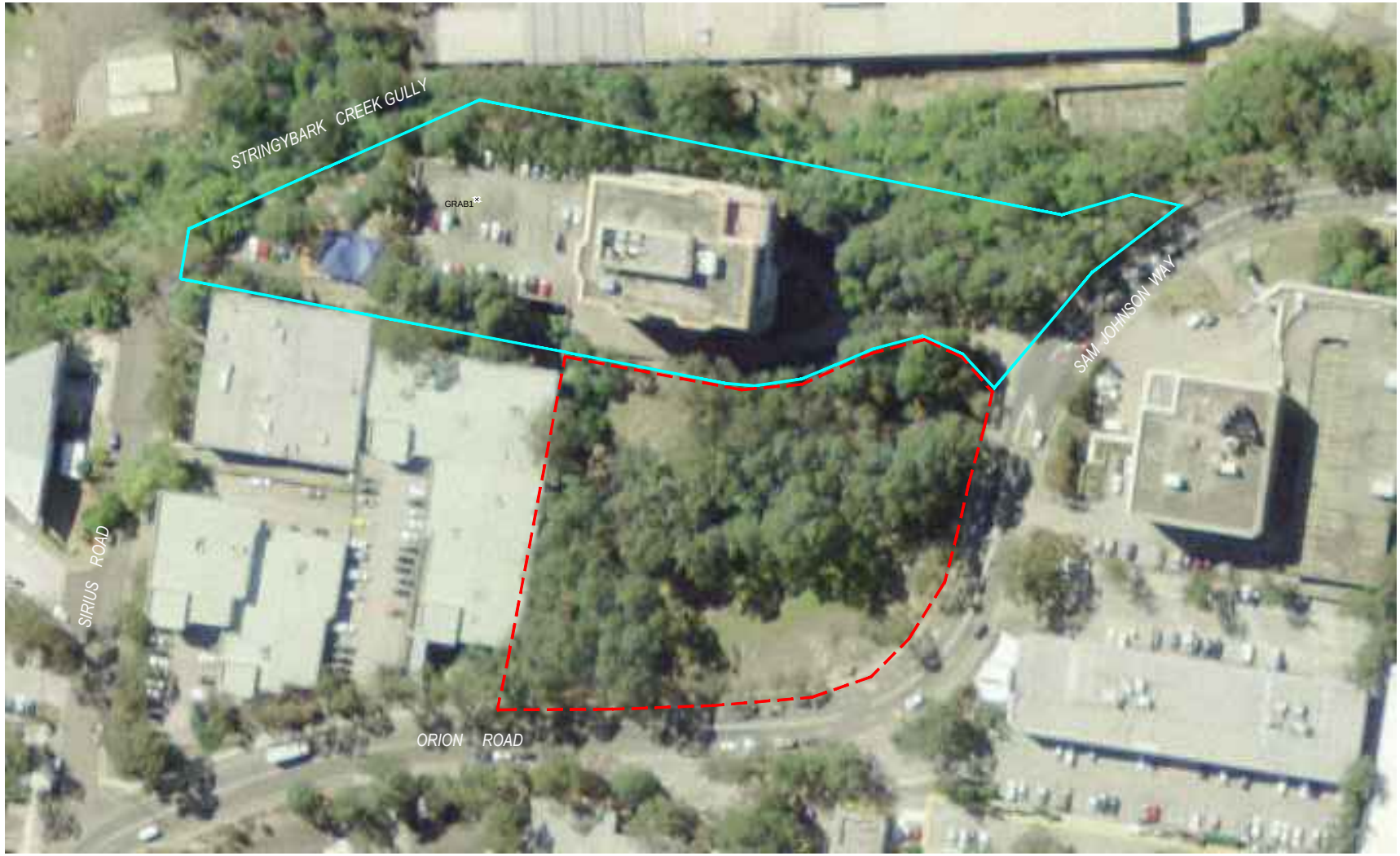
client: DEVELCO PTY LTD

project: ENVIRONMENTAL REVIEW OF 14-16 AND 18-20 ORION ROAD LANE COVE WEST, NSW

title: AERIAL PHOTOGRAPH - 2008

project no: ENAURHOD04594AB-R01 | figure no: FIGURE 3 | rev: A

PLOT DATE: 16/06/2015 4:08:56 PM DWG FILE: F:\ENVI\PROJECTS\ENAURHOD\ENAURHOD04 GOVIN\DIENAURHOD04500-04599\ENAURHOD04594 DUCRU LANE COVE WEST\ENAURHOD04594AB ENVIRONMENTAL REVIEW\DRAFTING\ENAURHOD04594AB.DWG



2013

LEGEND

14-16 ORION ROAD BOUNDARY

18-20 ORION ROAD BOUNDARY

20 0 20 40 60 80 100

Scale (metres) 1:2000

drawn	MV
approved	ACM
date	11/06/15
scale	AS SHOWN
original size	A4

coffey

client: DEVELCO PTY LTD

project: ENVIRONMENTAL REVIEW OF 14-16 AND 18-20 ORION ROAD LANE COVE WEST, NSW

title: AERIAL PHOTOGRAPH - 2013

project no: ENAURHOD04594AB-R01 | figure no: FIGURE 4 | rev: A

LEGEND

14-16 ORION ROAD BOUNDARY

18-20 ORION ROAD BOUNDARY

20 0 20 40 60 80 100

Scale (metres) 1:2000

drawn	MV
approved	ACM
date	11/06/15
scale	AS SHOWN
original size	A4

coffey

client:	DEVELCO PTY LTD
project:	ENVIRONMENTAL REVIEW OF 14-16 AND 18-20 ORION ROAD LANE COVE WEST, NSW
title:	AERIAL PHOTOGRAPH - 2015
project no: ENAURHOD04594AB-R01	figure no: FIGURE 5 rev: A

PLOT DATE: 16/06/2015 3:59:54 PM DWG FILE: F:\ENVIPROJECTS\ENAURHOD\ENAURHOD04 GOVIND\ENAURHOD04500-04599\ENAURHOD04594 D.UCRU LANE COVE WEST\ENAURHOD04594AB ENVIRONMENTAL REVIEW\DRAFTING\ENAURHOD04594AB.DWG

Appendix A – Historical Photographic Review

Photographic Record: 14-16 & 18-20 Orion Road, Lane Cove West NSW 2066 (12 June 2015)

Photograph 1: View to tenants sign at 18-20 Orion Road (June 2015)

Photograph 2: View of access road and tenants sign at 18-20 Orion Road (June 2015)

Photograph 3: View of multilevel building on 18-20 Orion Road (June 2015)

Photograph 4: View of sandstone brick square-shaped structure and associated pipe located to the north of the access road at 18-20 Orion Road (June 2015)

Photograph 5: View of ground level carpark located to the west of the multilevel building, 18-20 Orion Road (June 2015)

Photograph 6: View of ground level carpark located to the west of the Childcare Centre, 18-20 Orion Road (June 2015)

Photograph 7: View of loading dock and waste facility located at the southern end of the multilevel building, 18-20 Orion Road (June 2015)

Photograph 8: Storage rooms located in carpark are underneath the building footprint on 18-20 Orion Road (June 2015)

Photograph 9: Paint room located in carpark area underneath the building footprint on 18-20 Orion Road (June 2015)

Photograph 10: Building unit room located in carpark area underneath the building footprint on 18-20 Orion Road (June 2015)

Photograph 11: PVC pipe running weast-est along the northern edge of the carpark, 18-20 Orion Road (June 2015)

Photograph 12: view of bush strip to the north of the carpark, 18-20 Orion Road (June 2015)

Photograph 13: View towards the east end of the carpark, showing Childcare Centre at the end, electrical substation to the far left, 18-20 Orion Road (June 2015)

Photograph 14: North-western end of the carpark showing air conditioning units underneath the Childcare Centre, 18-20 Orion Road (June 2015)

Photograph 15: view of the squared-shaped water tank located underneath the building footprint (right) and the carpark exhaust pipe system (left), 18-20 Orion Road (June 2015)

Photograph 16: View of the end pipe part of the carpark exhaust pipe system, on 18-20 Orion Road (June 2015)

Photograph 17: Electric Substation located on the south-western portion of 18-20 Orion Road (June 2015)

Photograph 18: View of stormwater/drain system at the vicinity of the Childcare Centre, 18-20 Orion Road (June 2015)

Photograph 19: View of stormwater/drain system structures observed at the vicinity of the Childcare Centre, 18-20 Orion Road (June 2015)

Photograph 20: View of the Childcare Centre (far back) and associated carpark (18-20 Orion Road) from Sirius Road (June 2015)

Photograph 21: view of waste dumped on the bush strip at the western end of the northern boundary, 18-20 Orion Road (June 2015)

Photograph 22: view of dumped on the bush strip at the western end of the northern boundary, 18-20 Orion Road (June 2015)

Photograph 23: View of landscaped north-eastern boundary of 14-16 Orion Road (June 2015)

Photograph 24: View of fence along the southern boundary of 14-16 Orion Road (June 2015)

Photograph 25: View of bitumen gravel on surface at the southern portion of 14-16 Orion Road (June 2015)

Photograph 26: View of fragments of concrete observed at the fill mound located at the central part of 14-16 Orion Road (June 2015)

Photograph 27: View of a portion of fence located at the western end of 14-16 Orion Road (June 2015)

Photograph 28: metal road at 14-16 Orion Road (June 2015)

Photograph 29: view of overgrown vegetation and grassed surface at 14-16 Orion Road (June 2015)

Photograph 30: View of weed over fill mound at 14-16 Orion Road (June 2015)

Photograph 31: View of redundant electricity post on the southern boundary of 14-16 Orion Road (June 2015)

Photograph 32: View of pvc fragment observed on ground surface at 14-16 Orion Road (June 2015)

Appendix B – NSW EPA online records

Healthy Environment, Healthy Community, Healthy Business

Search results

Your search for: LGA: Lane Cove Municipal Council
Notice Type: Management Order
Date from: 01 Jan 1955
Date to: 12 Jun 2015

Matched 4 notices relating to 1 site.

Search Again
Refine Search

Suburb	Address	Site Name	Notices related to this site
Lane Cove	Lot 1 Sirius Road	Pacific Power Property	1 current and 8 former

Page 1 of 1

12 June 2015

Healthy Environment, Healthy Community, Healthy Business

Site and notice details

Your search for: LGA: Lane Cove Municipal Council
Notice Type: Declaration of Significantly Contaminated Land
Date from: 01 Jan 1955
Date to: 12 Jun 2015

1 notice on 1 site were matched.

Return to list of search results

Search Again
Refine Search

Area No: 3277

The information below was correct at the time the notices were issued.

Site: Caltex Service Station
Address: 428-432 Mowbray Road, Lane Cove North, 2066
LGA: Lane Cove Municipal Council

Occupier: Caltex Petroleum Pty Ltd
Owner: Caltex Petroleum Pty Ltd
Lot 19 DP 2136 Lot 20 DP 2136 Lot 21 DP 2136

Notices relating to this site (0 current and 3 former)

(Map) where available, maps show the part of the site affected by the notice
*notice matched search criteria

Notice recipient	Notice type & number	Status	Date
Not applicable	Amendment or Repeal of Order or Notice 20124414	Former	Issued 15 May 2012
Not Applicable	Declaration of Significantly Contaminated Land * 20101102 Map	Former	Issued 12 Apr 2010 Repealed 15 May 2012
Caltex Petroleum Pty Ltd	Approved Voluntary Management Proposal 20101702	Former	Issued 12 Apr 2010 Repealed 15 May 2012

12 June 2015

Healthy Environment, Healthy Community, Healthy Business

Search results

Your search for: LGA: Lane Cove Municipal Council
Notice Type: Declaration of Significantly Contaminated Land
Date from: 01 Jan 1955
Date to: 12 Jun 2015

Matched 1 notice relating to 1 site.

Search Again
Refine Search

Suburb	Address	Site Name	Notices related to this site
Lane Cove North	428-432 Mowbray Road	Caltex Service Station	3 former

Page 1 of 1

12 June 2015

Healthy Environment, Healthy Community, Healthy Business

Site and notice details

Your search for: LGA: Lane Cove Municipal Council
Notice Type: Management Order
Date from: 01 Jan 1955
Date to: 12 Jun 2015

4 notices on 1 site were matched.

Return to list of search results

Search Again | Refine Search

Area No: 3039

The information below was correct at the time the notices were issued.

Site: Pacific Power Property
Address: Lot 1 Sirius Road, Lane Cove, 2066
LGA: Lane Cove Municipal Council

Occupier: Pacific Power
Lot 1 DP 546860 Lot 2 DP 884454

Notices relating to this site (1 current and 8 former)

(Map) where available, maps show the part of the site affected by the notice
*notice matched search criteria

Notice recipient	Notice type & number	Status	Date
Demian Developments Pty Ltd	Notice for Maintaining Remediation 28027	Current	Issued 27 Sep 2005
Pacific Power	Notice for Maintaining Remediation 28014	Former	Issued 30 Mar 1999
Pacific Power	Notice for Maintaining Remediation 28007	Former	Issued 26 Aug 1998 Revoked 30 Mar 1999
Pacific Power	EHC Act Revocation Notice 510	Former	Issued 26 Aug 1998
Pacific Power	Section 35 EHC Act Order * 419 Map	Former	Issued 21 Jun 1996 Revoked 01 Sep 1998
Pacific Power	Section 35 EHC Act Order * 399 Map	Former	Issued 31 Mar 1995 Revoked 21 Jun 1996
Pacific Power	Section 35 EHC Act Order * 352 Map	Former	Issued 12 Aug 1993 Revoked 21 Jun 1996
Electricity Commission of NSW	Section 35 EHC Act Order * 245	Former	Issued 30 Apr 1990 Revoked 21 Jun 1996
Pacific Power	Notice for Maintaining Remediation 28015 Map	Not in force	Issued 30 Mar 1999 Invalid 27 Sep 2005

12 June 2015

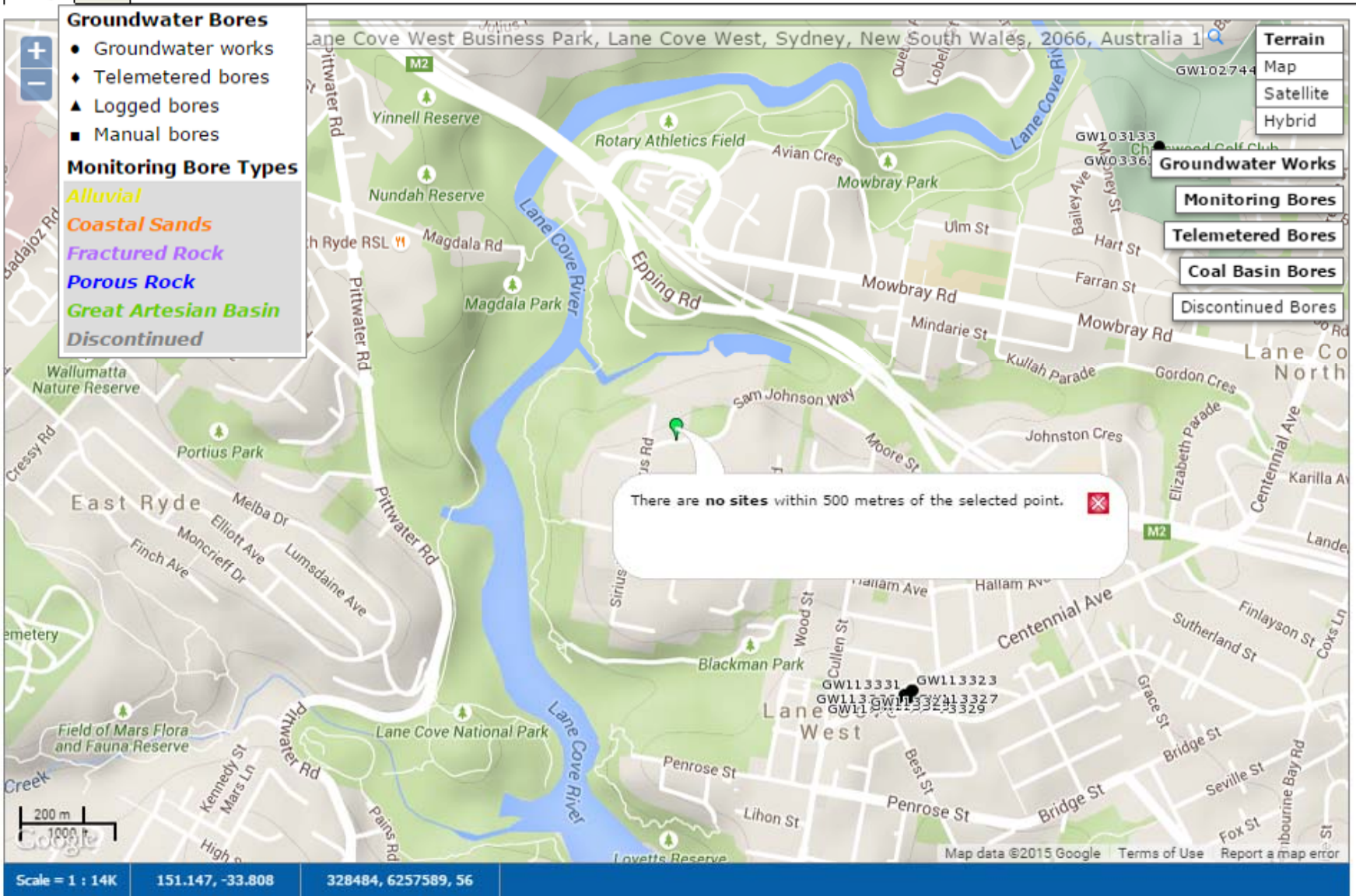
Appendix C – Groundwater Bore Search

All Groundwater

All Groundwater Map

All data times are Eastern Standard Time

Map | Info



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