



Preliminary Environmental Site Assessment – With Supplementary Soil and Groundwater Sampling

West Schofields Part Precinct
Schofields NSW 2762

CSR Ltd C/- Calibre Consulting

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ABBREVIATIONS

ACM	Asbestos Containing Material
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
AST	Above-ground Storage Tank
ASS	Acid Sulphate Soil
B(a)P	Benzo(a)Pyrene
BGL	Below Ground Level
BH	Borehole
BTEX	Benzene, Toluene, Ethyl Benzene, Xylene
COC	Chain of Custody documentation
CLM	Contaminated Land Management
DA	Development Application
DEC	Department of Environment and Conservation (NSW)
DECC	Department of Environment and Climate Change (NSW)
DECCW	Department of Environment, Climate Change and Water (NSW)
DLA	DLA Environmental Services
DP	Deposited Plan
DQO	Data Quality Objective
EC	Electrical Conductivity
EIL	Ecological Investigation Level
EMP	Environmental Management Plan
EPA	Environment Protection Authority (NSW)
ESL	Ecological Screening Level
HIL	Health-Based Investigation Level
LOR	Limit of Reporting
MW	Monitoring Well
NATA	National Association of Testing Authorities, Australia
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NHMRC	National Health and Medical Research Council
NRMMC	Natural Resource Management Ministerial Council
NSW	New South Wales
OCP	Organochlorine Pesticides
OEH	Office of Environmental and Heritage
OPP	Organophosphorus Pesticides
OH&S	Occupational Health and Safety
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PID	Photo-Ionisation Detector
PQL	Practical Quantification Limit
QA/QC	Quality Assurance and Quality Control
RAP	Remedial Action Plan
RPD	Relative Percentage Difference
SAC	Site Acceptance Criteria
SAQP	Sampling Analysis and Quality Plan
SEPP	State Environmental Planning Policy
SWL	Standing Water Level
TCLP	Toxicity Characteristic Leaching Procedure
TRH	Total Recoverable Hydrocarbons
UCL	Upper Confidence Limit
UST	Underground Storage Tank
VOC	Volatile Organic Compounds
WHS	Work Health Safety

EXECUTIVE SUMMARY

Following the completion of relevant background searches, historical aerial photography review and Site walkover a total of 17 Areas of Environmental Concern (AEC) were identified within the Part Precinct area. Several of the areas identified contained multiple lots, grouped together due to a similar historical land use. Two offsite influences were also identified directly adjacent to the Part Precinct area. Refer to **Section 5.0** and **Figure 3** for a full summary of AECs. A total of ten AECs were either partially or fully assessed via a visual site assessment (walk over) during the investigation with soil, groundwater and asbestos samples collected from targeted areas. The remaining AECs and Lots within the assessed AECs were unable to be accessed during the assessment and will require further investigation during the Detailed Environmental Site Assessment (DESA).

A DESA was completed on Part Lot 3 in DP 232574 (DLA, 2012), currently occupied by the CSR Brick factory and associated former quarry area. The 500,000m² (50Ha) parcel of land is situated directly north of Townson/Meadow Road within the Part Precinct. No groundwater contamination was identified to be present on Site with no further investigation for groundwater required. It should be noted that existing conditions apply to the Site for groundwater monitoring around the Landfill Stockpile as part of the landfill stockpile management plan. The remainder of the Lot south east of Meadow Road requires no further contamination investigation.

Further investigations were recommended for the brick factory, sales and display centre and associated hardstand storage areas to develop a better understanding of potential soil contamination, including investigation in to the USTs that were located on Site. Asbestos remediation of the stockpile bund along the eastern length of the Site and PAH hotspot remediation within the eastern bund and landfill stockpile were also recommended. It is recommended works to remediate the identified hotspot areas are undertaken in accordance with the NSW EPA Site Auditor Scheme to make the Site suitable for an end land use, consistent with NEPM 2013 Residential A - Residential with Garden / Accessible soils.

Site inspections were undertaken on the 24th May 2016 and 1st July 2016. Overall the Part Precinct consists of predominantly rural land with open paddocks, rural residential housing and remnant bushland vegetation. There are several properties which appear to have sheds and machinery present. Several market gardens are located throughout the Durham, Jersey and Kerry road areas.

Field investigation comprised of the following:

- Inspection of the Site;
- Conduct a review of Site history and aerial photographs to identify appropriate sampling locations prior to the commencement of work;

- 14 Test Pit investigations extending to natural soils;
- Installation of three groundwater monitoring wells;
- Collection of 21 targeted soil samples;
- Collection of three asbestos samples for w/w% analysis from three Test Pit locations;
- Collection of six asbestos fragment samples; and,
- Collection of three groundwater samples from onsite wells.

A total of 21 soil samples were collected for chemical analysis from the 10 properties assessed. An exceedance of the ESL Site Assessment Criteria (SAC) for the F3 Hydrocarbon fraction (300 mg/kg) was reported following analysis of Sample F-TP2 (480 mg/kg). The sample collection area is consistent with several of the properties investigated within the part precinct which were observed to contain machinery stored within the paddock and yard areas. These were observed to contain hydrocarbon staining and are within AEC 2, AEC 3, AEC 4 and AEC 9 following the Site inspection and AEC 5 from the desktop investigation. It is recommended that following the removal of the machinery all areas containing hydrocarbon staining are scraped on the surface with the soils appropriately classified by an environmental consultant. All other soil samples collected at the Site were reported to be compliant with the relevant SAC for BTEX, Volatile Total Recoverable Hydrocarbons (vTRH), Semi-Volatile TRH (sTRH), Polycyclic Aromatic Hydrocarbons, and Heavy Metals.

No groundwater samples collected from the Site were reported to have concentrations of BTEX, vTRH, sTRH or PAHs above the laboratory LOR. Exceedances of the NEPM 2013 Fresh Waters criteria were observed for Nickel and Zinc in all three groundwater samples analysed and for Chromium in BH02 and BH03. Groundwater in all samples was observed to be saline (electric conductivity of 5.1, 18 and 26 mS/cm). The reported exceedances of the NEPM 2013 GIL – Fresh Waters criteria were considered to be consistent with regional groundwater quality in the vicinity of the Site and not likely to pose a significant risk to human health as the saline groundwater is unlikely to be used for potable water.

Bonded ACM fragments were visually identified and confirmed by laboratory analysis in five locations Property E – TP3, Property E – TP4, Property F – TP1, Property F – TP2 and Property I – ACM. Asbestos in soils was observed and confirmed by laboratory analysis in in sample Property E – TP3 and sample 4 Durham Road (on property I). No samples reported the presence of asbestos fines/fibrous asbestos (AF/FA).

Several areas have been identified as requiring remediation or further investigation regarding asbestos contamination and are summarised below:

- Removal of asbestos fragments found on the ground surface on Property F (within AEC 9) should be undertaken by a licenced asbestos removalist. The area will then need to be validated by a licenced asbestos assessor;
- The asbestos fragments found on the found surface on Property I and on Lot 36 DP12076 (within AEC 11) should be further investigated to determine the extent of the asbestos in the underlying soils;
- The crushed building material paths on Property E (within AEC 13) should be further investigated to determine the extent of the Asbestos Containing Material (ACM) present within the path network of the market garden;
- The rubbish stockpile on Property E should be spread out and hand-picked by a licenced asbestos removalist. The area will then need to be validated by a licenced asbestos assessor.

Two offsite influences located within the direct vicinity of the Part Precinct include the Grange Avenue Landfill and Lot 1029 DP1191448 south of Townson Road. Both sites were utilised as landfills from approximately 1970-2000. It is recommended that investigation occurs into the potential for Landfill Gas (LFG) migration onto the Site.

It is therefore the opinion of DLA that the Site assessment objectives of this report have been achieved. The PESA concludes that the Site is considered suitable for the intended land use consistent with NEPM (NEPC, 2013) *Residential A – Residential with Garden / Accessible soil*, with the exception of the three identified areas. These areas of the Site can be made suitable through the removal of the fill materials and a subsequent asbestos clearance / validation report or further investigation within the Detailed Environmental Site Assessment.

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1.0 □ INTRODUCTION

1.1 □ General

DLA Environmental Services (DLA) was engaged by CSR Ltd C/-Calibre Consulting to conduct a Preliminary Environmental Site Assessment (PESA) with Supplementary Soil Sampling of the following area:

West Schofields Part Precinct, Schofields NSW 2762 (the Site).

The PESA was designed to be suitable for due diligence purposes. The document is intended to be incorporated into a rezoning application for redevelopment purposes and is suitable for review by the NSW EPA, Department of Primary Industries (DPI) and the Blacktown City Council.

1.2 □ Objectives

The project objectives of this PESA are to satisfy the relevant DA Conditions and the general requirements of State Environmental Planning Policy No.55 (SEPP 55) in accordance with *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA, 2011). Specifically, this PESA will consider a potential for suspected historical activities to have caused contamination at the Site and determine the suitability of the land for proposed future land use consistent with *Residential A* in the National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No.1) ('NEPM', NEPC, 2013). Should any potential adverse impacts to the environment or human health be identified, recommendations will be provided for additional assessment to determine if remedial action is required.

1.3 □ Scope of Works

To achieve this objective, DLA carried out the following works:

- Search and review of records and Site plans available locally and from State Regulatory Authorities, including WorkCover, Department of Lands and NSW EPA;
- Review of available previous reports for the Site;
- Review of historical aerial photographs available from the Land Information Centre;
- Review of all environmental conditions of the Site including the geology and hydrogeology;
- Site walkover inspection;

- Providing a comprehensive overview of the Site's past and current land uses and potential contamination issues;
- Targeted soil sampling;
- Provide a preliminary assessment of Site contamination (if any);
- Discuss the Site condition and suitability based on the proposed development;
- Assess the need (if any) for remediation and/or further investigations; and,
- Preparation of this PESA report in accordance with relevant EPA made or endorsed guidelines.

2.0 □ SITE DESCRIPTION

2.1 □ Site Identification

The Site identification details are summarised in **Table 2a** below:

Table 2a – Site Identification Summary

ITEMS	DETAILS
Site Name	West Schofields Part Precinct
Address	Schofields NSW 2762
Local Government Authority	Blacktown
Lot and Deposited Plan	Multiple (refer to Section 2.2)
Development Controls	Blacktown LEP 2015
Site Zoning	RU4 Primary Production Small Lots
Current Use (NEPM 2013 Table 1A(1))	Commercial / Industrial, public open space and residential with gardens / accessible soil
Proposed Use (NEPM 2013 Table 1A(1))	Residential with gardens / accessible soil
Site Area (approx.)	2,336,600 m ² (233.66 ha)
Locality Map	Refer to Figure 1 – Site Location
Site Survey	Refer to Figure 2 – Site Layout

2.2 □ Sites Associated with the Proposed Part Precinct

All lots within the Part Precinct are currently zoned RU4 within the Blacktown City Council LEP 2015, with the exception of South Road, Townson Road and Meadow Road and their adjacent road verges which are zoned SP2 Infrastructure. A total of 87 lots were identified within the Part Precinct, with an additional 14 part lots located east of Bell Creek and 10 part lots located west of Eastern Creek.

Refer to **Appendix B** – Blacktown LEP 2015 Zoning Map and **Appendix C** – Part Precinct Lots.

2.3 □ Boundaries and Surrounding Land Use

The boundary and surrounding landscape features of the Site are summarised in **Table 2b** below:

Table 2b – Boundaries and Surrounding Land Use

DIRECTION	DETAILS
North	South Road, Open Space Properties with Residential buildings and Grange Avenue Reserve
East	Eastern Creek, Open Space Properties with Residential buildings and Schofields Defence Depot
South	Townson Road, Colebee Release Area and Stonecutters Ridge Golf Club
West	Bells Creek, Open Space Properties with Residential buildings, Richmond Road and Marsden Park Industrial Area

Neighbouring premises are considered unlikely to pose a significant pollution risk to the Site.

2.4 Site Geology and Soils

The Penrith 1: 100,000 Geological Map Sheet (NSW Department of Mineral and Energy 1991) and the Site was assessed to be underlain by Bringelly Shale, with the formation comprising of shale, carbonaceous claystone, claystone, lithic sandstone, rare coal and tuff.

A surficial weathering profile of weathered shale comprising of silt clay soils with lateritic developments is present. Underlying the weathered material is weathered shales, laminated with various degrees of carbonaceous cementations. The base of the weathering was identified between 11 and 14m below ground level.

2.5 Site Topography

The Lot 3 DP232574 has an overall topographic gradient falling from the west (approximately 40m AHD) to the east (approximately 30m AHD), with the main plant area being elevated above the Site. The Site is dominated by the former quarry pit void that is estimated to be a depth of 30m below natural ground level (BGL).

The remainder of the part precinct has undulating gradual slopes and rises of up to 30m. Overall the Site slopes towards Eastern Creek in the east and Bells Creek in the West with a general slope from the north-west (30m AHD) to the south-east portion (20m AHD) of the Part Precinct.

2.6 Acid Sulphate Soils

A search undertaken on the Australian Soil Resource Information System (ASRIS, <http://www.asris.csiro.au>) on the 10th June 2016 indicated there is Low Probability or no known occurrence of Acid Sulphate Soils (ASS) at the Site.

The local geology of weathered Bringelly Shale provides further evidence that the occurrence of ASS is unlikely.

2.7 □ Salinity and Aggressivity of Soils

The *Salinity Potential in Western Sydney* map (DIPNR, 2002) indicates the areas of the Site directly adjacent to Bells Creek and Eastern Creek are of high salinity potential. The remainder of the Site is indicated as of moderate salinity potential.

The underlying Bringelly Shale formations have been known to contain saline groundwater and outbreaks of salt scalds. Salinity has been found to affect buildings in the areas of high potential, however these are site specific and based on previous land use combined with the salinity potential of the location.

2.8 □ Hydrology and Hydrogeology

The local Bringelly Shale formation, within the Wianamatta Group, has been known to contain saline groundwater. There are two aquifers, *regolith aquifer* (upper aquifer system) and *shale bedrock aquifer* (lower aquifer system) operating in the Wianamatta shales. The regolith aquifer system comprises water contained within the residual soil and colluvium derived from the shales and in the shale weathering profile itself, to a typical depth of 3-10m. The lower shale bedrock aquifer system occurs below the base of weathering. Both aquifer systems are not very permeable.

The Site is located outside of the Sydney Basin – Central Groundwater Management Area. Management of groundwater within the Site area is under the Blacktown LEP 2015. The plan aims to ensure that appropriate development occurs in the landscape with consideration of future population demands, economic issues and the protection of natural resources and environmental assets in the area. With respect to groundwater, the LEP aims ensure that development is prevented or restricted in locations where there is a high likelihood of groundwater contamination or the potential for development to increase salinity within the landscape. As the majority of the surrounding area is rural residential, minimal aquifer contamination is expected. The salinity potential is highlighted in **Section 2.7**.

A search of the NSW Office of Water groundwater data search identified 10 registered groundwater wells to be present within 2.1 km of the Site. Of the ten wells, five, identified as GW103957, GW103958, GW103959, GW103960 and GW103961 have been identified as being located on Site. On Site investigations did not locate any of the registered wells on Site.

All bores had minimal information available. However, groundwater well GW110658 located south west of the Site identified groundwater to be present at a depth of 9.82 metres extending to 10m below ground level. No other wells identified groundwater depths in the logs available for review. The data obtained from the NSW Office of Water groundwater data search is summarised in **Table 2c** below:

Table 2c – Regional Groundwater Summary Data

WELL ID	DISTANCE FROM SITE (m)	PURPOSE	DEPTH (m)	STANDING WATER LEVEL (m)	SALINITY (µS/cm)
GW103957	On-site	Monitoring	15.00	No Data	No Data
GW103958	On-site	Monitoring	20.00	No Data	No Data
GW103959	On-site	Monitoring	19.20	No Data	No Data
GW103960	On-site	Monitoring	20.00	No Data	No Data
GW103961	On-site	Monitoring	20.00	No Data	No Data
GW104310	NW – 1.4Km	Monitoring	9.00	No Data	No Data
GW104311	NW – 1.5Km	Monitoring	17.00	No Data	No Data
GW104308	NW – 1.7Km	Monitoring	14.00	No Data	No Data
GW112289	NE - 1.5Km	Monitoring	10.00	No Data	No Data
GW112290	NE - 1.5Km	Monitoring	10.00	No Data	No Data
GW110658	SW – 2.1Km	Monitoring	10.00	No Data	No Data

Refer to **Appendix F** – Groundwater Works Database Search.

Approximately 80% of the Site is unsealed and situated on low permeable soils. As such, rainfall is expected to mainly infiltrate the unsealed surfaces of the Site. Excess rainfall and that falling on the sealed surface is expected to flow into either Eastern Creek or Bells Creek.

2.9 □ Site Meteorology

The Bureau of Meteorology NSW gives the average annual rainfall for the Marsden Park area at 800.1mm, with an annual daytime temperature range of 16.5° to 28.5°C, and an annual average temperature of 24.1°C.

3.0 DEVELOPMENT CONTROLS

3.1 WorkCover Dangerous Goods Search

A Workcover NSW search regarding Lot 3 DP232574, 75 Townson Road, Schofields, NSW 2762, was undertaken within their Stored Chemical Information Database (SCID), which indicated that Dangerous Goods Licenses have been held for the premises in the past. The Dangerous Good Search identifies two tanks (13,500 L and a 3,000 Gallon) to have been registered on the Site, while a review of the HLA report (2004) also identifies an additional one 10,000L tank to be present.

Below are the summarised Underground Storage Tanks (USTs) identified to have been present on the Site:

Table 3a – USTs Identified At the Site

No. of Tanks	Type	Licensee	Stored Goods	Size	Licence Date
1	UST	Autobric Industries Pty Ltd	Mineral Spirits	3,000 gallon	10/07/1974
1	UST	PGH Ceramics Bricks NSW	Petrol	13,500 L	06/12/1979
1*	UST	--	Class 3	10,000 L	--

* Tank identified to be present in the HLA 2004 Phase 1 report

On Site investigations did not identify any of the recorded USTs to be present on Site, however a review of the included diagram and communications with onsite staff indicates that the UST locations in the included diagram would correspond with the current location of the weigh bridge east of the CSR display offices.

An inspection of the Site identified two diesel ASTs to be present along with an LPG gas tank, all located along the eastern side of the factory building. Additionally, high pressure gas is located on Site used for the running of the brick kiln. The gas main is located on the western side of the factory building.

Inspections around the exterior of the factory building identified two acid tanks/units containing sodium hypochlorite. Access into the factory building was generally restricted and dangerous goods within the factory should be investigated in more detail, when access permits.

Further inspections of the Site during the DESA (DLA, 2012) did not identify any further dangerous goods to be present on Site. While not observed during the Site inspection, it is assumed that chemicals used in the manufacturing of bricks and the running of the plant would likely be present. It is

recommended that a more in-depth assessment of AEC 1 be undertaken prior to and at a date closer to the redevelopment of the Site.

Discussions with Workcover were undertaken regarding lots within the Part Precinct that currently hold Dangerous Goods Licences. Lot 3 DP232574 was known currently hold a licence. Lot 11 in DP 12076 at 29 Kerry Road, Schofields NSW 2762 was identified as an additional property to currently hold a licence. DLA was unable to obtain permission to access the licence information during the investigation. It is recommended that this information is obtained during the Detailed Environmental Site Assessment for the Part Precinct.

Refer to **Appendix G** – Dangerous Goods Search.

3.2 Contaminated Land Record Search

A search was conducted of all records pertaining to section 58 of the *Contaminated Land Management Act 1997* (NSW) and revealed that the Site is not encumbered by any notices from the NSW EPA with regard to contaminated land. No sites in the vicinity of the Site were encumbered by any notices.

A search of the NSW EPA online *Protection of the Environment Operations Act 1997* (NSW) public register did not locate any records of licences, applications, notices, audits, or pollution studies/reduction programs for any location within the Site.

4.0 □ SITE HISTORY

4.1 □ Aerial Photograph Review

Aerial photographs from 1947 to 2016, available from the NSW Lands Department and NearMap, were reviewed by DLA with relevant observations summarised below:

Table 4a – Aerial Photograph Review

YEAR	DETAILS
<p>1947 Run 37</p>	<ul style="list-style-type: none"> - Predominantly, the western portion of the Site consists of partially cleared agricultural land with scattered remnant bushland. Numerous cattle tracks, farm dams, farm houses and smaller outbuilding are also present. Key features of this portion of the Site include cleared land with two houses in the southwest of the Site adjacent to Bells Creek (Lot 8 and Lot 9 DP17048) and cleared land with a farm dam within Lot 3 DP 232574; - The eastern portion of the Site consists of predominantly cleared rural lots with scattered farm houses. Cropping is evident in the northeast portion of the Site adjacent to Eastern Creek (Lot 7 to Lot 14 DP12076 and Lot 62 DP12076). Orchardng is present on multiple lots surrounding Durham road. Land surrounding Jersey, Angus and Kerry Roads are cleared agricultural lots with some farm housing and smaller outbuildings; - All roads present in image appear to be unsealed tracks. Meadow road is non-existent with cattle tracks in its future position; - Partially cleared land north of South Street in the current Grange Avenue Reserve location; - Land Cleared surrounding Durham, Kerry, and Jersey Roads in the East of the Site; Several Market Gardens on Kerry Road and Durham Road; One Orchard located west of Durham Road; and - Cleared Land south of the intersection of Townson road and Meadow Road with farm housing, a large dam and orcharding present on three lots.
<p>1955 Run 13</p>	<ul style="list-style-type: none"> - Additional land now cleared adjacent to Bells Creek (Lot 10 and Lot 11 DP17048); - Cleared land extended within Lot 3 DP232574; - Additional housing and cleared land along South Street; - Additional housing present on Durham Road. Cropping now evident on Lot 61 DP12076; - Remnant vegetation has increased in the Grange Avenue Reserve location with more defined access roads; - Meadow road now established; - Clearing of land has extended south of the intersection of Townson road and Meadow Road (external to the Site) with farm housing and cropping present; and - Land in the very east of the Part Precinct surrounding Kerry Road was not included in the image however no significant changes occurred from the 1947 and 1961 aerial photograph.

YEAR	DETAILS
<p>1961 Run 24W</p>	<ul style="list-style-type: none"> - A large stand-alone rectangular building in Lot 3 DP 232574 north of Townson Rd is probably the newly constructed main brick making plant. Adjacent to this are numerous vehicles and a smaller building, possibly a construction site office. The remaining areas are partially cleared remnant bushland with numerous tracks; vegetation is more established compared to 1947; - Both Townson Rd and Meadow Rd are unsealed but formed roads; - Land use surrounding Lot 3 DP 232574 is comprised of partially cleared agricultural land. Remnant bushland appears to be more established compared to 1947 and 1955; - Additional dwellings built on Durham Road including market gardens and orchards; Some sheds have been built however there are no industrial sites present; - Additional buildings now present south of Townson Road. Possibly being used as a nursery; and - No other significant changes from previous image.
<p>1965 Run 14W</p>	<ul style="list-style-type: none"> - Quarry now established in Lot 3 DP 232574 north of Townson Rd. Vegetation cleared surrounding the rectangular building. The Pit appears to be full of water. Access roads throughout the quarry; - Additional buildings and outhouses on South Road. Several sheds have been built northwest of Durham Road. - Several farms with extensive agriculture and orcharding now present south of Durham Road with long rectangular sheds on the lots (Lot A, B, C, and D DP376106 and Lots 24-27 DP12076); and - Additional dwellings built on Jersey, Angus and Kerry Roads with a small proportion practicing extensive agriculture; and - No other significant changes from previous image.
<p>1970 Run 10E</p>	<ul style="list-style-type: none"> - Quarrying is well established in Lot 3 DP232574 north of Townson Rd. There is a pocket of remnant bushland adjacent to this pit; to the north is a power-line easement. Cleared of high vegetation and trending southwest to northeast. North of the easement remnant bushland remains in place; - The main plant building has additions constructed on its south end (appears to be office complex) and western sides; to the northeast of the plant are brick stockpiles. Two smaller pits and stockpiles occupy the central portion of Lot 3. The eastern portion remains well vegetated with remnant bushland; - The portion of Lot 3 DP232574 south of Meadow Rd, comprising agricultural land appears mainly unchanged since 1961, however three additional buildings have been constructed south of the farmhouses. Limited clearing has occurred and a building has been constructed on land previously occupied by the Blacktown and Districts Mini Bike and Mini Cycle Club; - More extensive cropping evident on Durham Road and Kerry Road; - Large Sheds built on Lot 36 and Lot 37 DP12076 on Durham Road. Extensive agriculture present on Lot 36;

YEAR	DETAILS
	<ul style="list-style-type: none"> - The western portion of the property at Lot 52 DP12076 on Kerry Road has a track developed on the property with a dam in the centre and a number of buildings in the eastern portion of the property. The location is possible being used as a trotting track; - Land cleared north of South Road in the Grange Avenue Reserve location with a number of long bunds present; - Orchardring continues on Lot C DP376106 and Lot 25 DP12076 on Jersey Road; and - Orchardring has been established on Lot 9 and Lot 10 DP12076 on Kerry Road.
<p>1978 Run 9</p>	<ul style="list-style-type: none"> - Quarrying continues in Lot 3 DP232574 north of Townson Rd with an additional pit excavated to the north of the power-line easement (the present capped landfill). Remnant bushland remains in place around this pit's northern margin. The pit identified in 1970, south of the power-line easement still contains water; the adjacent pocket of remnant bushland remains in place. Extending to the northeast, around this remnant bushland, is an extensive cleared area extending to the eastern boundary and possibly includes stockpiled materials. Quarrying and stockpiling within the central portion of Lot 3 DP232574 has extended to the east; - The main plant building remains unchanged; however numerous linear brick stockpiles are more extensive to the north and east; - Townson Rd and Meadow Rd are unchanged since 1961; - The portion of Lot 3 DP232574 southeast of Meadow Rd now has tracks established throughout the property; - The area in the centre of the precinct surrounding Lot 3 DP232574 remains vegetated; - Significantly more cropping and poultry sheds surrounding Durham and Kerry Roads; - Lot 36 DP12076 Now has orcharding present in the centre of the property; - Lot 52 DP12076 on Kerry Road has a number of sheds built. Possible stables for the trotting track; - Orchardring continues on Lot C DP376106 and Lot 25 DP12076 on Jersey Road; - Orchardring continues on Lot 9 and Lot 10 DP12076 on Kerry Road; and - More extensive excavation present in the now discontinued Grange Avenue Landfill location (Lot 7 to Lot 12 DP193074 and Lot 205 to Lot 211 DP1204436).
<p>1982 Run 15</p>	<ul style="list-style-type: none"> - Excavation of the pit north of the powerline easement in Lot 3 DP232574 is continuing and has been partially filled with water. The area south of the power line easement remains unchanged. Quarrying in the central portion of Lot 3 DP232574 continues and further extends to the east compared to 1978 and now incorporates two pits; - The motorcycle track in the south east portion of Lot 3 DP232574 is now well established; - Landfilling still continues on the current Grange Avenue Reserve location (Lot 7 to Lot 12 DP193074 and Lot 205 to Lot 211 DP1204436). Part of the site has been grassed over with filling present on the southwest and northwestern portions of the site; - Remnant vegetation now cleared and houses currently being constructed on two rural lots adjacent to Lot 3 DP232574 on Townson Road; - Orchardring has been discontinued on Lot C DP376106 and Lot 25 DP12076 on Jersey Road;

YEAR	DETAILS
	<ul style="list-style-type: none"> - Orcharding continues on Lot 9 and Lot 10 DP12076 on Kerry Road; and - The track is more established on Lot 52 DP12076 on Kerry Road with the road access, stables and main building completed.
<p>1986 Run 15</p>	<ul style="list-style-type: none"> - The pit north of the power-line easement has reached its maximum extent and is filled with water. The area south of the power-line easement remains unchanged. There is a pocket of remnant bushland remaining within the central portion of Lot 3 DP232574; - An area at the northern margin of the brick stockpiling area appears to be a dump area and corresponds to dumped brick debris identified in the Site inspection area '6' (HLA, January 2004) of Lot 3 DP232574; - The present crushing plant and conveyor to the main plant have been constructed. A new office complex has been constructed south of the main plant with associated car park and grassed areas. The main plant building has an addition constructed on its northern section; - The south east portion of Lot 3 DP23257 has a dam constructed in the east of the property. The land use as a motorcycle track remains unchanged; - Much of the landfill in the Grange Avenue Reserve location (Lot 7 to Lot 12 DP193074 and Lot 205 to Lot 211 DP1204436) has been grassed over with some filling still present in the north east portion of the site; - Townson Rd and Meadow Rd have been sealed since 1978. Land use surrounding Lot 3 DP232574 remains unchanged Since 1978; and <p>The dam wall on Lot 52 DP12076 on Kerry Road has broken open with a culvert installed underneath the track.</p>
<p>1991 Run 6</p>	<ul style="list-style-type: none"> - The pit north of the power-line easement is no longer filled with water with excavation continuing; the remnant bushland remains in the central portion of Lot 3 DP232574; the pit south of the power-line easement is now filled with water; no other significant changes observed on the Site; - A number of sheds have been built on Lot 103 DP1207777 and Lot 71 DP1210436 on South Road. Car parking has been established on both of the sites; - Orcharding has been discontinued on Lot 9 and Lot 10 DP12076 on Kerry Road; - The void at the rear of the Grange Avenue Reserve location (Lot 7 to Lot 12 DP193074 and Lot 205 to Lot 211 DP1204436) is full of water. Two additional areas have been excavated in the southwest and northwest portions of the site. Trucks are present in the northwest portion of the Site; - No significant changes to Lot 52 DP12076 on Kerry Road.
<p>1994 Run 6</p>	<ul style="list-style-type: none"> - The pit north of the power-line easement is being backfilled and is connected to Meadow Rd by a new haul road allowing access by waste trucks. The area south of the power-line easement remains unchanged with the exception of an additional smaller, water storage dam located on the eastern boundary adjacent to the easement. Quarrying in the central portion of quarry site continues and is confined to one main pit east of the haul road. A small building / shed is identified to the east of the remaining pocket of remnant bushland, which is located to the south

YEAR	DETAILS
	<p>of the power-line easement and corresponds to dumped building debris identified in the site inspection area 'A' (HLA, January 2004);</p> <ul style="list-style-type: none"> - Remnant bushland no longer remains within the central portion of the quarry site; - The main brick plant appears to have been rebuilt since the 1986 photo. A new building outline and layout is present in the new photograph, along with the addition of a concrete slab at the northern end of the building and the development of the crushing plant and realigned conveyor to the main plant has been constructed adjacent to the former crushing plant; - A water storage dam is evident to the southeast, adjacent to Meadow Rd. A new weighbridge has been constructed adjacent to the office building, and what appears to be a building/awning is present where the diesel ASTs are currently located; - No significant changes to Lot 103 DP1207777 and Lot 71 DP1210436 on South Road; - The void at the rear of the Grange Avenue Reserve location (Lot 7 to Lot 12 DP193074 and Lot 205 to Lot 211 DP1204436) has been filled in. Buildings are present on the north west portion of the site with the south east and east portion of the site scattered with stockpiles; - Townson Rd and Meadow Rd remain unchanged since 1986; - Land use surrounding Lot 3 DP232574 remains unchanged since 1986; - Land use has changed on Lot 52 DP12076 on Kerry Road with a bitumen road established in the location of the track. There is an enclosed yard on the property with plant and machinery on the property.
<p>1998 Run 6</p>	<ul style="list-style-type: none"> - Backfilling of the pit north of the power-line easement (current Landfill Stockpile) is completed. The area has been revegetated with grasses and the haul road has been removed. The larger water storage dam south of the power-line easement is empty with some degree of revegetation occurring, the smaller dam located on the eastern boundary is still present. Quarrying in the central portion Lot 3 DP232574 continues to be confined to one main pit, which has extended since 1994; - An earthen bund has been constructed along the eastern margin of the Lot 3 DP232574 north of Townson Rd. The water storage dam southeast of the main pit has been reconstructed into two separate dams. - Townson Rd and Meadow Rd remain unchanged. Land use surrounding Lot 3 remains unchanged; - A void in the southern portion of the Grange Avenue Reserve location (Lot 7 to Lot 12 DP193074 and Lot 205 to Lot 211 DP1204436) is being progressively filled. The northwest portion of the site is now segregated from the remainder of the site with access from with access from Grange Avenue to the north. The remainder of the site is now grassed over; - Significantly more structures on Lot 52 DP12076 on Kerry Road. Possibly container storage as well as machinery within the enclosed yard. An additional building is present within the year, possibly an awning.
<p>2005 Run 6</p>	<ul style="list-style-type: none"> - The northern portion of Lot 3 DP232574 has trees cleared along the northern site boundary with imported material observed to be present in stockpiles. The small dam on the north eastern

YEAR	DETAILS
	<p>boundary still retains some water, though no evidence of the larger water storage dam along the power easement has been identified. Some tree clearing has also occurred centrally on the Site.</p> <ul style="list-style-type: none"> - The south eastern corner of the quarry has been filled in, with stockpiled material placed on the former quarry area; - Some additional materials (assumed to be for brick construction) have been imported into the central portion of the Site into the quarry area for storage. Additional bricks have been stockpiled along the eastern side of the main plant area above the quarry; - Grass has now been stripped back throughout the Grange Avenue Reserve location (Lot 7 to Lot 12 DP193074 and Lot 205 to Lot 211 DP1204436). The void on the southern portion of the site has now been filled. - No significant changes to Lot 52 DP12076 on Kerry Road; - No further significant changes have been observed.
<p>2010 NearMap 29th April</p>	<ul style="list-style-type: none"> - The pit in the centre of Lot 3 DP232574 continues to be filled with water; Remnant vegetation on and surrounding the property has increased; Two large stockpiles are located south of the southern Pit area; Increased vegetation on the portion of the lot south east of Meadow Road; - Several site offices remain on the Grange Road Reserve site with a haul road in the centre of the property; the western portion of the property remains without grass with small stockpiles throughout the property. - The Thomson road nursery has several long greenhouses with vegetation on the northern boundary; - The property directly north of the nursery has motor vehicles throughout with timber and rock bordering the property to the east; and - Lot 11 DP12076 has a long shed built with building rubble scattered throughout the Site.
<p>2016 NearMap 24th February</p>	<ul style="list-style-type: none"> - The pit in the centre of Lot 3 DP232574 has been backfilled and no water remains; The two large stockpiles south of the southern pit area have been used to backfill the pit; - The south eastern section of Lot 3 DP 232574 that was previously used as the motorbike track no longer has any buildings present; - The property directly west of Lot 3 DP232574 has extended its driveway area and has machinery and stockpiled material in the yard area; this is possibly used as a yard for scrap building material. - The greenhouses remain on the Thomson Road nursery property with a small dam adjacent to Bells Creek. - The property directly north of the nursery remains scattered with motor vehicles with rows of plants growing (presumed to supply the nursery) bordering the property to the east; - The market gardens on Durham Road remains with several greenhouse tunnels installed; - The premise on Lot 52 DP 12076 on Kerry Road that was previously used as the trotting track remains in use for the storage of machinery and building material

YEAR	DETAILS
	<ul style="list-style-type: none"> - The Grange Road Reserve has additional vegetation on the property with a vegetated stockpile in the centre of the previous landfilling area. Vegetation has increased on the boundary of the reserve; No other stockpiles remain on the property and the majority is grassed; and - Lot 11 DP12076 remains in use with building rubble scattered throughout the site and truck access evident.

Refer to **Appendix H** – Historical Aerial Photographs.

4.2 Historical Title Search

Title Search results from 1889 to 2016 were reviewed by DLA with relevant observations being summarised in **Tables 4b – Table 4s** below:

Table 4b – Historical Title Summary – Lot 25 in DP 12076

YEAR	SITE OWNER	LAND USE / OCCUPATION
1889	Charles Ward Pye	Landowner
1920	Charles Lytton Veron	Grazier
1927	John Hislop	Labourer
1941	Public Trustee	
1941	Ridge and Company Limited	
1949	William John Phyllis	Poultry Farmer
1976	Ethel Phyllis	Widow
1977	George Abraham Cecil Pimm	Grazier
1980	May Edna Saunton	Married Woman
2013	CSR Building Products Limited	

Table 4c – Historical Title Summary – Lot 28 in DP 12076

YEAR	SITE OWNER	LAND USE / OCCUPATION
1889	Charles Ward Pye	Landowner
1920	Charles Lytton Veron	Grazier
1927	David Hall	Labourer
1930	William Boyne Gowan Pickering and Rebecca Pickering	Labourer
1937	David Stall and Elizabeth Stall	Farmer
1942	Earnest Arthur Bruce	Water Board Official
1950	James Edward Robert Gibb	Fitter
1952	Joan Lakaties	Labourer
1956	George Henry Bowen and Thomas Jonathan Briggs	Assistant Buyer and Salesman
1985	Hedwiga Rosa Naef	
1985	Sonja Penelope Ractivand	
1986	Hedwiga Rosa Naef	
1989	Sonja Penelope Ractivand	
2001	Anton and Janja Colnaric	
2005	CSR Limited	

Table 4d – Historical Title Summary – Lot 10 in DP 12076

YEAR	SITE OWNER	LAND USE / OCCUPATION
1889	Charles Ward Pye	Landowner
1920	Charles Lytton Veron	Grazier
1925	Socratis Bahli	Farmer
1926	Charles Lytton Veron	Grazier
1956	Florence Isabell Veron	Widow
1956	Genevieve, Eugenie and Henri Veron	Spinsters and Company Director
1957	Francis Joseph Lindebaw	Fitter and Turner
1958	Norman Henry Buik and Bessie Buik	Pottery Manufacturer
1983	Norman Henry Buik	Pottery Manufacturer
1994	Michael John Dempsey	
1997	Gerard William Hughes and Hilary Jill Hughes	
2009	Gerard William Hughes	

Table 4e – Historical Title Summary – Lot 11 in DP 12076

YEAR	SITE OWNER	LAND USE / OCCUPATION
1889	Charles Ward Pye	Landowner
1920	Charles Lytton Veron	Grazier
1925	Socratis Bahli	Farmer
1926	Charles Lytton Veron	Grazier
1956	Florence Isabell Veron	Widow
1956	Genevieve, Eugenie and Henri Veron	Spinsters and Company Director
1958	Norman Henry Buik and Bessie Buik	Pottery Manufacturer
1958	Donald Allen and Dorothy Agnes Buik	Police Constable
1961	Frank and Jane Grima	Labourer
1987	Jane Grima	
1991	Keum Woo and Young Sook Lee	

Table 4f – Historical Title Summary – Lot 47 in DP 12076

YEAR	SITE OWNER	LAND USE / OCCUPATION
1889	Charles Ward Pye	Landowner
1920	Charles Lytton Veron	Grazier
1954	Florence Isabell Veron	
1954	Genevieve, Margaret and Henri Veron	Spinsters and Company Director
1960	Patrick and Ursula Lynch	Rigger
1960	James Patrick Sullivan and Victor Edgar Lederer	Solicitor and Estate Agent
1961	Wactano and Celina Mieczkowski	Carpenter
1988	Stanislaw, Kizystofa, Tadeasz and Michael Mieczkowski	

Table 4g – Historical Title Summary – Lot 48 in DP 12076

YEAR	SITE OWNER	LAND USE / OCCUPATION
1889	Charles Ward Pye	Landowner
1920	Charles Lytton Veron	Grazier
1954	Florence Isabell Veron	
1954	Genevieve, Margaret and Henri Veron	Spinsters and Company Director
1961	Jack and Chrysante Marshall	Engineer
1961	Marion Goetz	Electrician
1963	Mazarino Camenguli	Farmer
1965	Emanuel Busuttil	Truck Contractor
1970	Joe and Mary Bigeni	Fruit Box Dealer
2013	Joe Bigeni	
2013	Sang Hwa Lee and Ji Hye Jeong	
2014	Ji Hye Jeong, Bu Sik Jeong and Eul Hee Jeong	

Table 4h – Historical Title Summary – Lot 49 in DP 12076

YEAR	SITE OWNER	LAND USE / OCCUPATION
1889	Charles Ward Pye	Landowner
1920	Charles Lytton Veron	Grazier
1954	Florence Isabell Veron	
1954	Genevieve, Margaret and Henri Veron	Spinsters and Company Director
1960	Mervyn Rumble	Clerk
1960	Phillip John Cross	Manufacturers' Representative
1961	Constantinos Nikolopoulos	Labourer
1963	Joe Attard	Labourer

Table 4i – Historical Title Summary – Lot 51 in DP 12076

YEAR	SITE OWNER	LAND USE / OCCUPATION
1889	Charles Ward Pye	Landowner
1920	Charles Lytton Veron	Grazier
1954	Florence Isabell Veron	
1954	Genevieve, Margaret and Henri Veron	Spinsters and Company Director
1965	Vera Muriel Osborne	Married Woman
1966	Robert Stokoe Osborne	Carpenter
1972	Joseph Lawrence Vella and Pamela Vella	Brick Worker
1975	Charles Vella and Mary Antoinette Vella	Press Worker
2000	Craig Anthony Doherty and Anne Doherty	

Table 4j – Historical Title Summary – Lot 52 in DP 12076

YEAR	SITE OWNER	LAND USE / OCCUPATION
1889	Charles Ward Pye	Landowner
1920	Charles Lytton Veron	Grazier
1954	Florence Isabell Veron	
1954	Genevieve, Margaret and Henri Veron	Spinsters and Company Director
1957	Jonathan Bradley Regent	Meat Worker
1957	Dudley William James Bradley Regent	Meat Worker
1959	Allan Kenneth Colquhoun and Dawn Florence Colquhoun	Traveller
1967	Kenneth Rohanna and Irene Ethyl Rohanna	Salesman
1971	Walter Herbert Finn	Horse Trainer
1986	Jack Thompson Garvey	
1986	Keith William Dowling	
1988	Raymond Wehbe and Fay Wehbe	

Table 4k – Historical Title Summary – Lot 61 in DP 12076

YEAR	SITE OWNER	LAND USE / OCCUPATION
1889	Charles Ward Pye	Landowner
1920	Charles Lytton Veron	Grazier
1948	Myra Betty Webster	Wife of Albert George Webster
1966	Margaret Ferguson	Married Woman
1969	Joseph Ferguson	Labourer
1998	Jian Zing Zhong and Hai Yan Wu	

Table 4k – Historical Title Summary – Lot 33 in DP 12076

YEAR	SITE OWNER	LAND USE / OCCUPATION
1889	Charles Ward Pye	Landowner
1920	Charles Lytton Veron	Grazier
1935	Henry Thomas Whitehead	Labourer
1967	Lily Whitehead	Widow
1994	Charles Pace	Labourer

Table 4l – Historical Title Summary – Lot 34 in DP 12076

YEAR	SITE OWNER	LAND USE / OCCUPATION
1889	Charles Ward Pye	Landowner
1920	Charles Lytton Veron	Grazier
1924	Jessie Goodwin	Carpenter
1944	Charlotte Winifred Crampton and Ellice Crampton	Spinsters
1951	Benedict Said	Market Gardener
1952	Anthony Attard	Carrier
1953	Egio Vasarelli and Roberto Facchinei	Labourers
1954	Antonio Cecala and Roberto Facchinei	
1960	Frank Refalo	Labourer
1965	Frank Pace and Joyce Pace	Labourer
1982	J.M. Hobor Pty Limited	

Table 4m – Historical Title Summary – Lot 37 in DP 12076

YEAR	SITE OWNER	LAND USE / OCCUPATION
1889	Charles Ward Pye	Landowner
1920	Charles Lytton Veron	Grazier
1949	Arthur Douglas West and Ada Maud West	Fell Monger
1960	John Cutrupi and Angela Cutrupi	Farmer
1971	Tony Galea	Farmer
1973	John Iori and Edo Iori	Company Directors
1974	Brana Vucetoch and Maria Vucetich	Spray Painter
1978	Brana Vucetich	
1979	Vince Nagy and Catherine Nagy	Salesman
1993	Catherine Nagy (Later known as Caterina Nagy)	
2012	Monica Lidia Nagy	

Table 4n – Historical Title Summary – Lot 36 in DP 12076

YEAR	SITE OWNER	LAND USE / OCCUPATION
1889	Charles Ward Pye	Landowner
1920	Charles Lytton Veron	Grazier
1954	Florence Isabell Veron	Widow
1955	Adam Wroblewski and Jozef Romanowki	Labourer
1957	Adam Wroblewski	Labourer
1994	Nikolaos Taousanis and Theodora Taousanis	
1995	Alex Victor Spiteri and Joanne Mary Grace Lupi	Labourers
1954	Antonio Cecala and Roberto Facchinei	
1960	Frank Refalo	Labourer
1965	Frank Pace and Joyce Pace	Labourer
1982	J.M. Hobor Pty Limited	

Table 4o – Historical Title Summary – Lot C in DP 12076

YEAR	SITE OWNER	LAND USE / OCCUPATION
1889	Charles Ward Pye	Landowner
1920	Charles Lytton Veron	Grazier
1932	Ruskin James Bembrick	Poultry Farmer
1949	Robery Burns	Greengrocer
1952	Keith Kelly and Geoffrey Mervyn Kelly	Machinist and Electrical Tester
1956	Jeno Vajai and Maria Vajai	Labourer
1957	Muriel Parkin	Sternographer
1962	Emil Rieser and Lola Rieser	Blacksmith
1979	Giovanna Cunningham	Domestic Duties
1980	Bruce Tee Chong	Farmer
1983	King Chang Cheung, Oliver Cheung and Bruce Tee Chong	
1992	Bruce Tee Chong and Nelson Yi Hung Chong	
2000	Adam Robert Dunn, Carolyn Maree Dunn and Bruce Tee Chong	
2013	Carolyn Maree Dunn and Bruce Tee Chong	

Table 4p – Historical Title Summary – Lot D in DP 12076

YEAR	SITE OWNER	LAND USE / OCCUPATION
1889	Charles Ward Pye	Landowner
1920	Charles Lytton Veron	Grazier
1932	Ruskin James Bembrick	Poultry Farmer
1949	Robert Burns	Greengrocer
1952	Olexi Riabokow	Labourer
1955	Olexi Riabokow and Maria Riabokow	
1962	Maria Riabokow	
1970	Angelo Farrugia and Lonza Farrugia	Labourer
2003	Lonza Farrugia	
2007	Catherine Lourdes Scicluna, Vince Charles Anthony Farrugia and Charlie Farrugia	
2008	Emanuel Degabriele	
2011	Chao – Ming Tseng	

Table 4q – Historical Title Summary – Lot 43 in DP 1175138

YEAR	SITE OWNER	LAND USE / OCCUPATION
1924	John Albert Milford, Alfred Vincent Milford, Gerard Douglas Milford and Beatrice Dora Goud.	Architect, Solicitor, Retired Dentist and Teacher of Music.
1936	Alfred Vincent Milford	Solicitor
1944	Frank Gordon Watts	Bank Official
1967	Eileen Edith Watts and James Thomas Watts	Widow and Soil Conservationist
1968	Canine Caterers Pty. Limited	
1980	Elio Grah and Giovanna Grah	Nurseryman and his wife
1993	Giovanna Grah	
1999	Trezette Pty. Limited	
2002	Rose Mary McAdam and Thomas Stephen McAdam	

Table 4r – Historical Title Summary – Lot 9 in DP 17048

YEAR	SITE OWNER	LAND USE / OCCUPATION
1924	John Albert Milford, Alfred Vincent Milford, Gerard Douglas Milford and Beatrice Dora Goud.	Architect, Solicitor, Retired Dentist and Teacher of Music.
1936	Alfred Vincent Milford	Solicitor
1939	Doris Isabel Hart and Geoffrey Alan Hart	Solicitor
1944	Geoffrey Elevyn Ward	Labourer
1967	Annie Madelene Ward	Widow
1967	Marshall Norris Powell and Dorothy Jane Powell	Malster
1973	Ivan Chris Hying	Company Director
1973	Toyoshima Australia Pty. Limited	
1979	Ian Hutchinson and Meralynne June Hutchinson	Lecturer
1981	Carmel Grima and Rosalie Grima	
1983	Charles Grima and Rose Grima	
2009	Charles Grima	

Table 4s – Historical Title Summary – Lot 10 in DP 17048

YEAR	SITE OWNER	LAND USE / OCCUPATION
1924	John Albert Milford, Alfred Vincent Milford, Gerard Douglas Milford and Beatrice Dora Gooud.	Architect, Solicitor, Retired Dentist and Teacher of Music.
1936	Alfred Vincent Milford	Solicitor
1939	Doris Isabel Hart and Geoffrey Alan Hart	Solicitor
1944	Geoffrey Elevyn Ward	Labourer
1967	Annie Madelene Ward	Widow
1967	Marshall Norris Powell and Dorothy Jane Powell	Malster
1973	Ivan Chris Hying	Company Director
1973	Toyoshima Australia Pty. Limited	
1979	Anna Rosalea Paliatoeas and Elizabeth Pipal	
1984	Emmanuel, Paul and Mary Degabrielle	
1983	Emmanuel and Paul Degabrielle	
2009	Carmelo, Joe and Emmanuel Degabrielle	
2013	Gracemello Pty. Limited	

Refer to **Appendix I** – Historical Title Summary.

4.3 Heritage / Archaeological Items

A search of the Office of Environment and Heritage's (OEH) Aboriginal Heritage Information Management System (AHIMS) indicates that there are 34 registered Aboriginal Sites within the Part Precinct. An extensive archaeological survey should be undertaken to highlight the exact locations of the identified Aboriginal Sites.

Refer **Appendix J** – AHIMS Search.

4.4 Site History Summary

The Part Precinct area was primarily a rural setting with numerous cattle tracks and gravel roads prior to 1950. Remnant vegetation was still highly evident in the landscape. Rural residential housing was more evident within the landscape from 1955 with a range of land uses, including: orcharding, poultry farming and market gardening. The brick making plant was built on Lot 3 DP 232574 prior to 1961 with the quarry established by 1965. The current road network in the area was fully established by 1970. The Grange Avenue Landfill (External to the Site) was established by 1970 and continued to be

filled until approximately 2002. The Blacktown mini-bike club was operational in the south east portion of the Part Precinct between 1970 prior to its closure in 2013. The Schofields soccer club has been established on South Street within the Part Precinct from approximately 1990 to present. Several market gardens are still operational within the Durham Road and Kerry Road area with the remainder of the landscape dominated by hobby farms. Several sites are also utilised for truck and machinery storage on Kerry Road, Townson Road and Durham Road including Lot 28 DP12076, Lot 51 DP12076 and Lot 9 DP17048.

5.0 □ SITE INSPECTION

Site inspections were undertaken on the 24th May 2016 and 1st July 2016. Overall the Part Precinct consists of predominantly rural land with open paddocks, rural residential housing and remnant bushland vegetation. There are several properties which appear to have sheds and machinery present. There is a Nursery present on 9 Townson Road (Lot 43 DP 1175138), bordering Bells Creek with vehicles and machinery stored at the rear of the property (AEC 5).

On 24th May 2016 a total of seven properties were inspected and a total of 32 Test Pits excavated with 14 samples collected for chemical and salinity analysis. Refer to **Appendix L** for Test Pit Logs. On 1st July 2016 a total of three properties were inspected with a total of three boreholes augured, with 6 samples collected for chemical analysis and three groundwater monitoring wells installed. Refer to **Appendix M** for Bore Logs. Refer to **Figure 3** for locations of Property Inspections and AEC's.

Property A on Lot 10 DP12076, located within AEC 7, housed a residential weatherboard dwelling with several sheds, aviaries, and a fenced pond. The rear of the property was an open paddock with a dam and bund in the middle of the paddock and remnant vegetation bordering Eastern Creek. No asbestos was identified on the exterior of the sheds and dwelling present. The banks of the dam appeared to be constructed of material generated during the construction of the corresponding dam, with no foreign materials noted on the surface of dam banks. No obvious surface staining, odours, imported fill materials, dangerous goods or items of heritage or archaeological significance were observed across the property during the inspection. A large shed was present on the neighbouring property to the south. Evidence of machinery was observed, however no further evidence of chemical storage could be visually identified during the inspection.

Property B on Lot 48 DP12076, located within AEC 12, housed a residential dwelling with a dam at the front of the property. The banks of the dam appeared to be constructed of material generated during the construction of the corresponding dam, with no foreign materials noted on the surface of dam banks. The property is currently used to produce soy sauce on a small scale for a local market. A shed located behind the main dwelling was observed to contain asbestos in fair condition. A section of the shed previously identified in the historical aerial photograph review had previously been demolished with no evidence of on-site disposal. Several fragments and asbestos sheets remain at the rear of the shed. A pile of burnt rubbish was also observed behind the shed. The remaining portion of the property contained a series of immature fruit trees and grassed and weeded vegetation. No areas of bulk filling were observed during the test pitting investigation. The stockpiles observed in the rear of the property during the historical photograph review were no longer present. No further evidence of chemical contamination was observed during the site inspection.

Property C on Lot 52 DP12076, located within AEC 3, housed a residential dwelling at the front of the property with possible asbestos cladding. The house appeared to be in good condition externally. Maintained gardens surrounded the house and the driveway. In the centre of the property was a storage yard for trucks and machinery. Minor evidence of staining was observed below the trucks during the Site inspection. One test pit was excavated in this location (C-TP1). A locked compound contained additional machinery which was inaccessible during the Site inspection. One test pit was excavated external to the compound adjacent to some machinery (C-TP4). The rear half of the property contained an open paddock with a large dam. At the rear of the property were several storage containers and items of machinery. Two test pits were excavated in this location (C-TP2 and C-TP3). No areas of bulk filling were observed during the test pitting investigation.

Property D on Lot 25 DP12076, located within AEC 8, contained an open paddock with remnant vegetation and dense high grasses. A dwelling was removed from the northeast portion of the property in 2014. No evidence of asbestos was identified in the footprint of the previously removed dwelling. One test pit was excavated in this location. Soils were observed to be light brown sandy soils to 0.4m below ground level (bgl) with natural clays below. The previous location of the shed south of the main dwelling had one test pit excavated with natural clay soils observed from 0.4mbgl. Although some rubbish and concrete was observed on the surface no evidence of bulk filling was observed. One test pit was also excavated southwest of the previous primary dwelling location directly adjacent to a concrete slab from the base of a previously demolished shed. Light brown silty soils were observed to be a similar consistency to the main dwelling location with natural clays from 0.3m bgl. The previous orchard location south of the demolished dwelling was also inspected with one test pit excavated with no evidence of fill soils identified. No further evidence of areas of fill were identified during the site inspection.

Property E on Lot 61 DP12076, located within AEC 13 consisted of a working market garden with a brick dwelling at the front of the property and a series of greenhouses growing hydroponic vegetables throughout the property and raised beds in the rear half of the property. Two sheds were also located at the front of the property that contained a forklift and tractor. This could also possible be a pesticide storage location. Four test pits were excavated throughout the property during the site inspection. E-TP1 was located behind the main dwelling within the back yard. Fragments of fibrous sheeting were identified in this location however they were confirmed as negative for asbestos following laboratory analysis. TP2, located in the middle of the property within a pile of rubbish was observed to contain orange natural clays from 0.3m bgl. No staining was evident in the excavated soils. TP3 was located within a path in the middle of the property. Natural clays were observed from 0.2m bgl below the path. Building rubble containing fragments of asbestos were observed within the paths between greenhouses on the property. The fragments were confirmed to contain asbestos. TP4 was excavated adjacent to a path in the west of the property. A banded stockpile approximately 30m long and 2.0m

wide containing unconsolidated rubbish and building materials was in this location. Asbestos fragments and sheeting were observed within the stockpile during the site inspection. Chemical containers were also observed within the fill materials. The rear of the property had previously been identified as a potential area of investigation during the aerial photography review, however this area was inaccessible by the backhoe during the site inspection.

Property F on Lot 34 DP12076, located within AEC 9, contained a market garden and dam within the eastern half of the property. No evidence of rubbish in fill soils were observed on the external surface of the banks surrounding the dam. A dwelling and two sheds, all containing possible asbestos cladding were located in the central section of the property. Several items of machinery and excavation equipment were located in the centre and western section of the property. Stained soils were observed in several locations in this area surrounding the machinery. The remaining area of the property was sparsely vegetated with tall grasses. Four test pits were excavated on the property. F-TP1, located in the western portion of the property contained red silty soils to 0.2m bgl with natural red clays from 0.2 m. Asbestos fragments were also observed on the ground surface surrounding the test pit. No areas of fill were identified surrounding the test pit location. F-TP2, located within the machinery storage area contained some stained brown silty soils with inclusions of building rubble to 0.5m bgl. Potential hydrocarbon contamination was observed surrounding the test pit. F-TP3, located directly adjacent to the northern shed on the property was observed to contain silty topsoil to 0.3m with natural red clays from 0.3m. Several lengths of asbestos pipe were also observed in this location. The cladding on the adjacent shed was observed to be in poor condition. F-TP4, was located southeast of the main dwelling adjacent to the market garden. Some machinery was also located in this location. The material consisted of dark brown topsoil to 0.3m bgl with natural orange and grey mottled clays from 0.3m. No other evidence of fill areas were observed during the site inspection.

Property G on Lot 9 DP17048, located within AEC 4, contained a trucking and storage business. The front section of the property contained an open horse paddock with remnant vegetation bordering the property to the west. The main dwelling on the property is constructed of brick and tile with a large storage shed located behind it. A long asphalt driveway leads to a trucking storage yard with two 27,500L above ground diesel storage tanks (ASTs). The ASTs were in good condition and housed within a walled compound. No evidence of spillage was evident at the time of inspection. Several trucks, storage containers and items of machinery were present within the bitumen driveway and gravel storage yard. Surface staining was evident in several locations throughout the driveway and yard area consistent with its land use. The large storage shed was unable to be accessed at the time of inspection. Four test pits were excavated at the rear of the property within an area of historical stockpiling and machinery storage. G-TP1 was excavated in a grassed area next to a stockpile of sand, building rubble and steel. The stockpile was situated on natural red clays below 0.2m bgl. A large stockpile of dark brown silty clay material approximately 600m³ in size appeared to have no inclusions

and could possibly have been excavated material from the Site. G-TP2 was excavated at the rear of the property directly adjacent to a stockpile of mixed clays. The stockpile was inspected by the backhoe and no inclusions were observed in the top 0.5m excavated. G-TP3 was excavated into a stockpile on the western side of the rear yard. Six small stockpiles were located in this area with inclusions of bitumen, concrete and steel. Some small fragments of fibrous cement material were observed in the yard that were confirmed to contain no asbestos. G-TP4 was excavated at the very rear of the property within an area housing vintage trucks in a state of disrepair. No evidence of hydrocarbon staining was observed surrounding the vehicles.

Property H on Lot 500 DP1214310, located within AEC 17, contained a brick and tile residence with a gravel driveway. The property is predominantly grassed, with remnant bushland vegetation bordering the property to the west. A swimming pool was located behind the primary dwelling with a storage shed in the middle of the property. Several shipping containers were located at the rear of the property; the contents were unable to be identified at the time of inspection. The property is located 50m southeast of the former Grange Avenue Landfill across South Street. No areas of fill or stockpiles were identified at the Site. One borehole was augured, with a groundwater monitoring well installed, at the rear of the property. Soils included sandy silty topsoil to 0.5m bgl with clays to 6.0m bgl were observed.

Property I on Lot 37 DP12076, located within AEC 11, contained a child care centre within the front section of the property. A bitumen driveway serviced both the child care centre and the primary residence. Remnant bushland was scattered throughout the property. A large storage shed was observed east of the primary residence with a constructed dam at the rear of the property. No evidence of asbestos was observed on the surface of the previously removed sheds near the main residence. One borehole was augured, with a groundwater monitoring well installed, at the rear of the property. Soils included dark brown topsoil to 0.3m bgl with clays to 1.5m bgl and underlying shales to 1.0m bgl. Fragments of asbestos were observed on the surface near the boundary of the property with 8 Durham road near the well installation location. There was a greater concentration of fragments and evidence that supports the prior removal of a structure within the 8 Durham Road property.

Property J on Lot 28 DP12076, located within AEC 2, contained a fibrous cement (FC) sheeted dwelling with an FC sheeted outhouse. There was a pool at the rear of the main dwelling, a paddock to the side and rear of the dwelling and rows of olive trees fronting Meadow Road. No evidence of staining was observed in the area previously utilised to store buses and trucks on the property. A constructed dam was located in the southeast corner of the property. One borehole was augured, with a groundwater monitoring well installed, at the rear of the property. Soils included silty clay topsoil to 0.3m bgl with clays to 3.5m bgl and underlying shales to 7.0m bgl.

6.0 □ SUMMARY OF PREVIOUS INVESTIGATIONS

6.1 □ Phase 1 – Environmental Site Assessment, Lot 3 DP 232574, Townson Road , Schofields (HLA Envirosiences Pty Limited, May 2004)

HLA Envirosiences completed a Phase 1 Environmental Site Assessment (ESA) on Part Lot 3 in DP 232574, currently occupied by the CSR Brick factory and associated former quarry area. This is identified as AEC 1 in **Figure 3**. The purpose of the report was to identify site constraints to future site quarrying and backfilling followed by redevelopment to the highest possible end-use.

The ESA was undertaken as part of the Development Application for CSR's accelerated development of the Site involving the extraction and stockpiling of shale feedstock and subsequent backfilling of the void with engineered Virgin Excavated Natural Material (VENM). The Site comprises a shale quarry working section and void, various stockpiles of clay feedstock and overburden and a water storage dam. The remaining portions of the Site contain an exhausted and capped solid waste landfill (with a leachate management system), main production plant, crushing plant, water storage systems and offices. Currently one licenced 10,000L Underground Storage Tank (UST) is located at the Site.

The Site was considered suitable for the intended activities, however due to past potentially contaminating activities in specific areas at the Site, some remedial actions will be warranted in those areas during the redevelopment of the Site.

Building and brick rubble originating from onsite processes or dumped as imported fill in the solid waste landfill will require classification in Accordance with NSW EPA guidelines and appropriate disposal to a licenced facility. Assessment of the potential contamination of surface waters affected by drainage from the main plant. If contamination is identified, an appropriate management plan for the storage and use of chemicals at the Site would need to be developed to prevent the distribution of contaminants over a wide area of the Site. Based on the available information, potential leachate generated from the solid waste landfill is not considered to be a significant source of contamination that could potentially impact the proposed redevelopment of the Site.

6.2 □ Stage 2 – Detailed Environmental Site Assessment, 75 Townson Road Schofields (DLA Environmental, November 2012)

DLA Environmental completed a Detailed Environmental Site Assessment (DESA) on Part Lot 3 in DP 232574, currently occupied by the CSR Brick factory and associated former quarry area. This is identified as AEC 1 in **Figure 3**. The 500,000m² (50Ha) parcel of land is situated directly north of Townson/Meadow Road within the Part Precinct.

The Brick factory and associated hard stand storage area is limited to the western portion of the Site and consists of an area of approximately 6.8ha. The remainder of the Site currently consists of the former quarry and clay preparation/stockpile area in the southern and eastern portions of the Site (approximately 21.7Ha). The northern portion of the Site consists of undisturbed bushland and a landfill stockpile, located over an exhausted shale quarry, commissioned by CSR to be utilised as a landfill for non-putrescible General Solid Waste imported fill 'Soccer field' pad.

Soils sampled across the Site were assessed against the Site Acceptance Criteria (SAC) provided by the National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999 Table 5a Column A – Residential with Garden / Accessible soil, as applicable to the identified potential future land use of the site.

A systematic sampling strategy was employed to assess the soils on Site with a total of 272 soil samples were submitted to SGS Australia in Alexandria for a range of laboratory analyses with an additional four groundwater wells previously installed on Site analysed for the investigation. Visual observations identified six distinct areas within the Site, and are characterised as follows:

- Area 1 – Brick factory, sales and display centre and associated hardstand storage areas;
- Area 2 – Southern section of the site consisting of the brick clay preparation and storage areas;
- Area 3 – The stockpile bund along the eastern length of the Site;
- Area 4 – Main quarry and brick making material stockpile storage area;
- Area 5 – Landfill Stockpile and 'soccer field' pad; and,
- Area 6 – Remnant bushland around the Landfill Stockpile, power line easement and north of the main quarry pit.

No groundwater contamination was identified to be present on Site with no further investigation for groundwater required. It should be noted that existing conditions apply to the Site for groundwater monitoring around the Landfill Stockpile as part of the landfill stockpile management plan.

The results of the report conclude that Areas 2, 4 and 6 of the Site are deemed suitable for the proposed end land use with no contamination exceeding the Site criteria identified. Further investigations are recommended for Area 1 of the Site to develop a better understanding of potential soil contamination, including investigation in to the USTs that were located on Site, where unrestricted access to Area 1 is available. Asbestos remediation in Area 3 and PAH hotspot remediation in Area 3 and Area 5 are required to made the Site suitable for an end land use, consistent with NEPM 1999 Residential A - Residential with Garden / Accessible soils.

Refer to **Appendix K** – CSR Phase 2 - Site Layout and Sampling Locations.

6.3 **Schofields Rd Stage 3 Contaminated Land Management and Geotechnical Investigation Report (Parsons Brinkerhoff, for RMS, August 2012)**

An existing report undertaken by Parsons Brinkerhoff in 2012 for the Stage 3 of the Schofields Road upgrade by RMS. The Stage 3 area includes the northern boundary of the Part Precinct South Street, Schofields. Potential sources of contamination highlighted in the report included historical filling of areas, motor vehicles and road maintenance, the adjacent landfill and maintenance of rural land. All sources were considered to be of Low, or Low-Moderate contamination potential. The contamination investigation involved the drilling of nine vertical boreholes and three hand augured boreholes with subsequent soil sampling. Nine groundwater monitoring wells were also installed and sampled at the Site. Of the nine sampling locations, three were located within the Part Precinct area, south of South Street (SF10, SF13 and SF15).

All soil samples collected at the Site were analysed to be below the HIL-A Thresholds prescribed by the NEPM (2013) for all analytes examined. Moderate concentrations of salts (K, Na, Ca, Mg, P, N and SO₄) were identified in all locations. Samples were collected from three groundwater sampling locations within the Part Precinct area. Exceedances of the 95% protection of freshwater ecosystems, outlined in ANZECC (2000) were reported for Arsenic (SF10), Cadmium (SF10 and SF15), Chromium (Sample SF15), Copper (SF10, SF13 and SF15), Nickel (SF10, SF13 and SF15) and Zinc (SF10, SF13 and SF15). Groundwater in all samples was observed to be strongly saline (electric conductivity ranging from 17.6 to 20.5 mS/cm). The reported exceedances of the 95% ANZECC (2000) criteria were considered to be consistent with background groundwater quality in the vicinity of the Site. It was considered that groundwater is not likely to pose a significant risk to human health as the saline groundwater is unlikely to be used for potable water. Fibrous cement sheeting identified in the assessment area was analysed to contain chrysotile asbestos, however the material encountered was north of South Street and outside of the Part Precinct area.

7.0 AREAS OF ENVIRONMENTAL CONCERN AND POTENTIAL CONTAMINANTS OF CONCERN

Following the review Site historical review and a Site Inspection several Areas of Environmental Concern (AEC) have been identified, summarised in **Table 7a** below. The Part Precinct area has predominantly been semi-rural with the exception of the CSR Brick Making Plant and the associated quarry up to the present. Previous and current land uses within the Part Precinct include market gardening, poultry farming, orcharding, machinery storage, truck and bus storage and hobby farming. There is a Nursery present on 9 Townson Road (Lot 43 DP 1175138), bordering Bells Creek with vehicles and machinery stored at the rear of the property. A large shed is present on Lot 11 DP12076 and DLA understands a Dangerous Goods Licence for chemical storage is owned by the property, however the specific landuse or Dangerous Goods Licence was unable to be obtained at the time of reporting. The contamination potential for the Part Precinct is not considered high although the presence of historical filling practices, which could contain asbestos, could not be precluded from any site within the precinct.

Table 7a – Areas of Environmental Concern - Summary

Within the Part Precinct Area						
AEC Number	Lot	DP	Land use	Contaminant Source	Contaminant Types	Risk of Contamination
1	3	232574	Brick Making Plant and Quarry from approximately 1960 to present (Part Lot north of Townson Road). Former mini-bike club (Part Lot east of Meadow Road).	Uncontrolled fill material, reworked local soils, bitumen, fuels, oils and greases.	Heavy metals, Hydrocarbons (TPH/BTEX/PAHs), Asbestos.	Low-Moderate
2	Lot 28	12076	Truck Storage in this location from approximately 2000 to present.	Bitumen, fuels, oils and greases.		
3	Lot 51 and Lot 52	12076	Trotting Track throughout from approximately 1970-1990. Trucks and plant machinery on premise from the approximately 1995.			
4	Lot 9	17048	Yard with scrap building material, machinery and stockpiled material from 2010 to present.			
5	Lot 43	1175138	Nursery location from approximately 1990 to present. Rear of the property has stored motor vehicles from approximately 2000 to present.	Application of pesticides/herbicides, fertilisers, uncontrolled fill material, reworked local soils, bitumen, fuels, oils and greases.	Heavy metals, OCP/OPPs, Hydrocarbons (TPH/BTEX/PAHs) Nutrients, Asbestos.	Low-Moderate
6	Lot 11	12076	Long Shed present on Premise from approximately 2005. Scrap building materials throughout the site. Market Garden from approximately 1970-1990.	Application of pesticides/herbicides, fertilisers, uncontrolled fill material, reworked local soils.	Heavy metals, OCP/OPPs, Hydrocarbons (TPH/BTEX/PAHs) Nutrients, Asbestos.	Low
7	Lot 9 and Lot 10	12076	Market Garden from 1940s, Orchardring Present in the 1970s and 1980s.			
8	Lots 24-27	12076	Orcharding from the 1970s to 1980s and Market garden to the early 1990s. Possible poultry shed present to the later 1960s.			

Within the Part Precinct Area

AEC Number	Lot	DP	Land use	Contaminant Source	Contaminant Types	Risk of Contamination
9	Lot 33 and Lot 34	12076	Market Garden from the 1970s to present and Machinery Storage.	As above, with fuels, oils and greases in addition.	Heavy metals, OCP/OPPs, Hydrocarbons (TPH/BTEX/PAHs) Nutrients, Asbestos	Low
10	Lot 35 and Lot 36	12076	Market Garden from the 1970s to the early 1990s, some orcharding throughout the 1980s.	Application of pesticides/herbicides, fertilisers, uncontrolled fill material, reworked local soils.		
11	Lot 37	12076	Sheds on Property Throughout the 1970s to 1990s. Potential poultry farm.			
12	Lot 47, Lot 48 and Lot 49	12076	Market Garden from the 1980s to present			
13	Lot 61 and Lot 62	12076	Market Garden from the 1940s to present			
14	Lot C	376106	Orcharding from the 1970s to 1980s and Market garden to the early 1990s.			
15	Lot D	376106	Sheds on the property from the 1960s to present. Possible poultry farm. Some orcharding present in the 1980s.			
16	Lot 10	17048	Market garden in the 1980s and early 1990s. Some orcharding during this period.			
17	Lot 108, Lot 109 and Lot 110. Lot 500	DP120777 7 and DP121431 0	Across the road and down gradient of the Grange Avenue landfill location.		Seepage and migration of hazardous chemicals and gasses from landfill cells. Airborne migration of wastes.	Hydrocarbons (TPH/BTEX/PAHs), heavy metals, nutrients, OCP/OPPs, leachate and VOCs'.

External to the Part Precinct – Offsite Influences						
AEC Number	Lot	DP	Landuse	Contaminant Source	Contaminant Type	Risk of Contamination
18	Lot 1029	1191446	Large Yard with Sheds and Trucks, possible filling site from the 1970s to 1990s	Seepage and migration of hazardous chemicals and gasses from landfill cells. Airborne migration of wastes. Bitumen, fuels, oils and greases	Hydrocarbons (TPH/BTEX/PAHs), heavy metals, nutrients, OCP/OPPs and leachate	Low-Moderate
19	Lot 7 to Lot 12 and Lot 205 to Lot 211	DP193074 and DP120443 6	Landfill facility from 1975 to 2001	Seepage and migration of hazardous chemicals and gasses from landfill cells. Airborne migration of wastes.		

Notes:

TPHs: Total Petroleum Hydrocarbons

BTEX: Benzene / Toluene / Ethyl benzene / Xylenes

PAHs: Polycyclic Aromatic Hydrocarbons

OCP/OPPs: Organochlorine and Organophosphate Pesticides

Refer to **Figure 3 – Areas of Environmental Concern**, for the locations of each AEC.

8.0 □ SAMPLING ANALYSIS AND QUALITY PLAN

8.1 □ Data Quality Objectives

The NEPM (NEPC, 2013) and Australian Standard (AS) 4482.1-2005 recommends that data quality objectives (DQOs) be implemented during the investigation of potentially contaminated sites. The DQO process described in *AS 4482.1-2005 Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil Part 1: Non-Volatile and Semi-Volatile Compounds* outlines seven distinct steps to outline the project goals, decisions, constraints and an assessment of the project uncertainties and how to address these when they arise. The DQOs have been summarised in **Table 8a** and **Table 8b** below:

Table 8a – Summary of DQOs

1	State the Problem	Have previous land uses affected the suitability of the Site for Residential A as defined by NEPM (NEPC, 2013)?
2	Identify the Decisions	<ul style="list-style-type: none"> - Does historical information indicate a potential for contamination to be present at the Site? - Do contaminant concentrations in the soil comply with the stated screening levels? - Do soils on the Site currently require any remedial action / risk management? - Have the previous land uses affected the environmental quality of the land? - Are there any identifiable risks to human health or the environment on Site?
3	Identify Inputs to Decisions	<ul style="list-style-type: none"> - Undertake appropriate searches of the site to determine any recorded history of detrimental effects on the Site. - Judgemental soil sampling across the Site. - Determination of the general concentrations of chemicals across the Site. - Identifying current and future potential receptors and the likelihood of exposure to unacceptable levels of contamination both on and off the Site.
4	Define Study Boundaries	The physical study will focus on fill materials, natural soils and groundwater within the confines of the proposed lot boundary.
5	Develop Decision Rule	<p>The Site will be considered suitable for its intended land use if concentrations of soils and groundwater comply with the screening levels provided in NEPM (NEPC, 2013), as determined by the following Site Assessment Criteria (SAC) being applied to the data:</p> <ul style="list-style-type: none"> - The 95% Upper Confidence Limit (UCL) of the arithmetic mean for each Contaminant of Concern must comply with the respective screening level; - The individual contaminant concentration should not exceed the screening level by more than 250%, and; - The standard deviation of individual contaminants should not exceed 50% of the HIL.
6	Specify Limits on Decision Errors	Field and laboratory quality controls are implemented to avoid error and to ensure the action levels exceed the measurement detection limits. The performance of decision making inputs will be enhanced through the application of Data Quality Indicators (DQI), defined in Table 7b below.
7	Optimise Design for Obtaining Data	<ul style="list-style-type: none"> - Ensure access to all relevant and previous environmental data. - Identify the most resource-effective sampling and analysis design for general data that are expected to satisfy the DQOs.

Table 8b – Summary of DQIs

DATA PRECISION AND ACCURACY	
Acceptable Relative Percentage Difference (RPD)	>10 x LOR: 30% inorganics; 50% organics (Field)
	<10 x LOR: Assessed on individual basis (Field)
Adequate Laboratory Performance	>5 x LOR: 50% (laboratory)
	<5 x LOR: No Limit (laboratory)
	Based on acceptance criteria of laboratory as specified on certificate of analysis, includes: blank samples, matrix spikes, control samples, and surrogate spike samples.
	Use of analytical laboratories with adequately trained and experienced testing staff experienced in the analyses undertaken, with appropriate NATA certification.
DATA REPRESENTATIVENESS	
Sample and Analysis Selection	Representativeness of all contaminants of concern.
Trip Blanks	No detection above LOR.
Trip Spikes	Recoverable concentrations of volatiles between 60 – 140%.
Laboratory Selection	Adequate laboratory internal quality control and quality assurance methods, complying with the NEPM (NEPC, 2013).
DOCUMENTATION COMPLETENESS	
Chain of Custody Records	Laboratory sample receipt information received confirming receipt of samples intact and appropriate chain of custody.
	NATA registered laboratory results certificates provided.
DATA COMPLETENESS	
	Analysis for all contaminants of concern.
	Field duplicate sample numbers complying with NEPM (NEPC, 2013)
	Trip spike samples prepared and sent with field samples regularly.
COMPARABILITY	
	Use of NATA registered laboratories.
	Detailed logs of all sample locations recorded.
	Test methods comparable between primary and secondary laboratory
	Acceptable RPD's between original samples and field duplicates and inter-laboratory triplicate samples.

8.2 □ Field Investigation Procedure

The likelihood of contamination was assessed by comparison of assessment results with NSW EPA produced or endorsed criteria available at the time this report was published. Sampling was performed on a judgemental basis and targeted any areas identified as potential high risk for contamination. The justification of the sampling point regime for the assessment was based on the investigator's knowledge, operational requirements, experience and history of the Site. All historical investigations and anecdotal evidence supported the sampling approach adopted and provided for samples to be collected in an appropriate manner. Field investigation comprised of the following:

- Inspection of the Site;
- Conduct a review of Site history and aerial photographs to identify appropriate sampling locations prior to the commencement of work;
- 14 Test Pit investigations extending to natural soils;
- Installation of three groundwater monitoring wells;
- Collection of 21 targeted soil samples;
- Collection of three asbestos samples for w/w% analysis from three Test Pit locations;
- Collection of six asbestos fragment samples; and,
- Collection of three groundwater samples from onsite wells.

A detailed summary of the sampling locations and analytes are outlined in **Table 8c** below.

Table 8c – Sample summary, Locations and Analytes

Sample Number	Sample Name	Sample Type	Depth (mbgl)	AEC Number	Sampling Location	Analytes	
1	A-TP1	Soil	0.5	7	Lot 10 DP12076– Former Shed Locations	vTRH, sTRH, PAHs, Heavy Metals, Pesticides and PCBs	
2	A-TP2		0.3				
3	B-TP1		0.4	12	Lot 48 DP12076 – Dam bund location and former shed location		
4	B-TP2		0.3				
5	C-TP2		0.5	3	Lot 52 DP12076 – Former Stockpile location and machinery storage location		vTRH, sTRH, PAHs and Heavy Metals
6	C-TP4		1.0				
7	D-TP2		0.4	8	Lot 25 DP12076 – Former shed location and former orchard location	vTRH, sTRH, PAHs, Heavy Metals, Pesticides and PCBs	
8	D-TP4		0.2				
9	E-TP2		0.3	13	Lot 61 DP12076 – Rubbish pile location and rubbish stockpile location		
10	E-TP4		0.2				
11	F-TP1		0.2	9	Lot 34 DP12076 – Machinery Storage locations		
12	F-TP2		0.3				
13	G-TP1		0.2	4	Lot 9 DP17048 – Machinery storage location	vTRH, sTRH, PAHs and Heavy Metals	
14	G-TP3		0.2		Lot 9 DP17048 – Stockpile location		
15	G-TP3 Bitumen		1.5		Lot 9 DP17048 – Stockpile location	PAHs	
16	1m - 31 south		1.0	17	Lot 500 DP1214310 – GW Well installation location	vTRH, sTRH, PAHs and Heavy Metals, Pesticides and PCBs	
17	0.5 - 31 south		0.5		Lot 500 DP1214310 – GW Well installation location		
18	1.5 - 4 Durham		1.5	11	Lot 37 DP12076 – GW Well installation location	vTRH, sTRH, PAHs and Heavy Metals	

Sample Number	Sample Name	Sample Type	Depth (mbgl)	AEC Number	Sampling Location	Analytes
19	0.5 - 4 Durham	Soil	0.5	11	Lot 37 DP12076 – GW Well installation location	vTRH, sTRH, PAHs, Heavy Metals, Pesticides and PCBs
20	0.5 - 46 Durham		0.5	2	Lot 28 DP12076 – GW Well installation location	vTRH, sTRH, PAHs and Heavy Metals
21	0.2 - 46 Durham		0.2			vTRH, sTRH, PAHs, Heavy Metals, Pesticides and PCBs
22	E-TP4	Fragment	Surface	13	Lot 61 DP12076 – Rubbish pile location and rubbish stockpile location	Asbestos fragment identification
23	E-TP3				Lot 61 DP12076 – Path of building rubble location	
24	E-TP1				Lot 61 DP12076 – Fragments in backyard of main dwelling	
25	F-TP1			9	Lot 34 DP12076 – ACM on ground surface	
26	F-TP2					
27	4 Durham ACM					
28	E-TP4	Soil	0.2	13	Lot 61 DP12076 - Rubbish Stockpile location	Asbestos w/w % analysis
29	E-TP3				Lot 61 DP12076 – Path of building rubble Location	
30	4 Durham Road				11	
31	MW#1	Groundwater	N/A	11	Lot 37 DP12076 – Rear of Property closest to Landfill	vTRH, sTRH, PAHs and Heavy Metals
32	MW#2			17	Lot 500 DP1214310 – Rear of property, down gradient of landfill	
33	MW#3			2	Lot 28 DP12076 – South western area of property. Down gradient from truck storage.	

Notes:

TPHs: Total Petroleum Hydrocarbons

BTEX: Benzene / Toluene / Ethyl benzene / Xylenes

PAHs: Polycyclic Aromatic Hydrocarbons

OCP/OPPs: Organochlorine and Organophosphate Pesticides

Refer to **Figures 4 – 13** –Site Layout with Sampling Locations for sampling locations on each of the 10 Sites investigated.

8.2.1□ Soil Collection

Soil samples for chemical analyses were generally collected in accordance with the *Sampling Design Guidelines* (NSW EPA, 1995), NEPM (NEPC, 2013) and AS4482.1-2005. Samples were obtained using a decontaminated trowel and immediately transferred to sample containers of appropriate composition (glass jars for chemical analysis, plastic bags for asbestos). Job number, sample identification number, sampler's initials and the date of sampling were recorded on sample labels affixed to the sample containers.

Chemical samples were then placed immediately into a chilled esky to prevent the loss of potential volatile components. The samples were transported under standard DLA chain-of-custody protocols to the NATA accredited laboratories – Envirolab Services Pty Ltd and Australian Safer Environment & Technology Pty Ltd. All chemical samples were stored and transported at temperatures below 4°C.

All samples were collected by DLA staff who are specifically trained in hazardous waste field investigation techniques and health and safety procedures. All techniques used are specified in DLA Field Manual for Contaminated Sites, which are based on methods specified by the United States Environment Protection Agency (US EPA) and NEPM (NEPC, 2013).

8.2.1□ Groundwater Collection

Groundwater samples were collected from three wells, two wells approximately 200 metres down gradient of the Grange Avenue Landfill and one within the CSR owned Site utilised for the storage of busses and trucks on Durham Road. Purging and sampling of monitoring wells was conducted in accordance with the NEPM (NEPC, 2013), the *Guidelines for the Assessment and Management of Groundwater Contamination* (NSW DEC, 2007) and the *Murray-Darling Basin Groundwater Quality Sampling Guidelines*.

Wells were purged with a disposable plastic bailer. Relatively low recharge in the wells prevented the use of a low-flow peristaltic pump for sampling. Groundwater samples were obtained using a disposable plastic bailer. Samples were collected into laboratory prepared sample containers for specific analytes, i.e. into a combination of plastic unpreserved, plastic preserved, glass amber unpreserved and preserved glass vials. All samples were collected and filled into the respective sample containers so no head space remained in the sample container, with no loss of any preservation agents, where present. All samples were then placed immediately into a chilled esky to prevent the loss of potential volatile components.

8.3 Analytical Strategy

Samples were analysed for listed chemicals based on potential contamination in the area and to allow for a preliminary assessment of all representative areas of the Site. Samples were analysed for the following parameters:

8.3.1 Inorganics

- Heavy metals: arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni), and zinc (Zn); and,
- Asbestos.

8.3.2 Organics

- Total Recoverable Hydrocarbons (TRH);
- Monocyclic Aromatic Hydrocarbons (BTEX);
- Volatile TRH (vTRH);
- Organochlorine Pesticides (OCs);
- Organophosphorus Pesticides (OPs);
- Polycyclic Aromatic Hydrocarbons (PAHs); and,
- Polychlorinated Biphenyls (PCBs).

No Photo Ionisation Detection (PID) assessments were undertaken as TRH analyses were performed on all samples.

8.4 Site Acceptance Criteria

The Site Acceptance Criteria (SAC) have been chosen in accordance with current Australian and NSW EPA guidelines. The criteria provided are the most current and widely accepted for Tier 1 assessment of land use suitability at present in Australia, and have generally been developed using a risk-based approach.

8.4.1 Soil Criteria

Criteria from the NEPM (NEPC, 2013) Schedule B1 were utilised for this assessment. Soil HSLs for vapour intrusion were used for volatile petroleum contaminants, whilst the US EPA Regional Screening levels were cited to extrapolate criteria for volatile halogenated compounds.

With regard to the vapour intrusion criteria, the NEPM (NEPC, 2013) provides Health Screening Levels (HSLs), Ecological Screening Levels (ESLs) and Management Limits (MLs) for TRH fractions in soil and groundwater based on concerns regarding ecological impacts, inhalation of vapours and direct contact with contaminant sources. The material type of ‘clay’ (or ‘fine’) has been used as it offers the most similar correlation to the condition of soils at the Site.

Table 8d –TRH Soil Criteria for Vapour Intrusion (mg/kg) [CLAY]

ANALYTES	HSL-A (Clay) 0 to 1.0m	HSL-A (Clay) 1.0 to <2.0m	HSL-A (Clay) 2.0 to <4.0m	Direct Contact HSL-A
Benzene	0.7	1	2	100
Toluene	480	NL	NL	14,000
Ethylbenzene	NL	NL	NL	4,500
Xylenes	110	310	NL	12,000
Naphthalene	5	NL	NL	1,400
F1: C₆-C₁₀	50	90	150	4,400
F2: C₁₀-C₁₆	280	NL	NL	3,300
F3: C₁₆-C₃₄	NA	NA	NA	4,500
F4: C₃₄-C₄₀	NA	NA	NA	6,300

NL = Not Limiting (i.e. the soil vapour concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario).

NA = Not Applicable (i.e. NEPM (NEPC, 2013) does not provide HSLs for the F3 and F4 hydrocarbon fractions)..

Vapour Intrusion Criteria sourced from NEPM (NEPC, 2013) *Table 1A(3) – Soil HSLs for vapour intrusion.*

Direct Contact Criteria sourced from Friebel and Nadebaum 2011, Health Screening Levels for petroleum Hydrocarbons in Soil and Groundwater, Part 1: Technical Development Document, *Table A4 – Soil Health Screening Levels for Direct Contact.*

Table 8e – Criteria for Total Recoverable Hydrocarbons ESL and ML (mg/kg) [FINE]

ANALYTES	ESL (Fine)	ML (Fine)
	Urban Residential and Public Open Space	Urban Residential and Public Open Space
Benzene	65	--
Toluene	105	--
Ethylbenzene	125	--
Xylenes	45	--
Benzo(a)Pyrene	0.7	--
F1: C₆-C₁₀	180	800
F2: C₁₀-C₁₆	120	1,000
F3: C₁₆-C₃₄	1,300	3,500
F4: C₃₄-C₄₀	5,600	10,000

ESLs obtained from NEPM (NEPC, 2013) *Table 1B(6) – ESLs for TPH fractions, BTEX and benzo(a)pyrene in soil.*

MLs obtained from NEPM (NEPC, 2013) *Table 1B(7) – Management Limits for TPH fractions F1-F4 in soil.*

Table 8f – Site Assessment Criteria for Soils (mg/kg)

ANALYTES		HIL-A ¹
HEAVY METALS	Arsenic	100
	Cadmium	20
	Chromium	100
	Copper	6,000
	Lead	300
	Mercury	40
	Nickel	400
	Zinc	7,400
PAH	BaP TEQ	3
	Total PAHs	300
PCB	PCB	1
PESTICIDES	Aldrin/Dieldrin	6
	Chlordane	50
	DDT+DDE+DDD	240
	Heptachlor	6
ASBESTOS	Bonded ACM	0.01% w/w
	Friable Asbestos/Asbestos Fines	0.001% w/w
	Surface Asbestos (0.1m)	No Visible

Health Investigation Levels sourced from NEPM (NEPC, 2013) Table 1A(1)

Asbestos Health Screening Levels sourced from NEPM (NEPC, 2013) Table 7.

8.5 □ Groundwater Criteria

Criteria for groundwater were obtained from both NEPM (NEPC, 2013) and ANZECC (2000). The validation criteria for groundwater are provided in **Table 7g**.

Table 7g – Groundwater Investigation Levels (µg/L) (ANZECC 2000; NEPM 2013)

ANALYTES		NEPM HSL ¹ 2 to <4m	ANZECC ² 95% Fresh Water
BTEX	Benzene	5,000	950
	Toluene	NL	--
	Ethylbenzene	NL	--
	m+p-Xylene	NL	200
	o-Xylene	NL	350
	Total Xylene	NL	--
TRH	C ₆ – C ₁₀	NL	--
	C ₁₀ – C ₁₄	NL	--
HEAVY METALS	Arsenic (III)	--	24
	Arsenic (V)	--	13
	Cadmium	--	0.2
	Chromium (III)	--	--
	Chromium (VI)	--	1
	Copper	--	1.4
	Lead	3.4	3.4
	Mercury	--	0.6
	Nickel	--	11
PAH	B(a)P	--	0.2*

NL = If the derived groundwater HSL exceeds the water solubility limit, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or NL.

¹ Groundwater Health Screening Levels for Vapour Intrusion sourced from NEPM (NEPC, 2013) Table 1A(4) – Groundwater Health Screening Levels.

² 95% Fresh Water Criteria sourced from Australia and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC, 2000).

9.0 RESULTS

9.1 Soil Results

The sampling regime involved the collection of 21 representative surface, fill and natural underlying soil samples which were submitted to Envirolab Services Pty Ltd undergoing a range of laboratory analyses. The results of the assessments conducted at the Site are summarised below:

9.1.1 Monocyclic Aromatic Hydrocarbons, Volatile Total Recoverable Hydrocarbons and Semi Volatile Total Recoverable Hydrocarbons

Twenty samples collected were analysed for Volatile Total Recoverable Hydrocarbons (vTRH) and Benzene, Toluene, Ethyl benzene, Xylene and Naphthalene (BTEX). There were no concentrations of vTRH, BTEX or Naphthalene recorded above the Laboratory Limit of Reporting (LOR).

Twenty samples were also analysed for semi-volatile Total Recoverable Hydrocarbon (sTRH) compounds. A detection of the F3 (C₁₆-C₃₄) hydrocarbon fraction was reported in Sample F-TP2 (480 mg/kg), exceeding the ESL Site Acceptance Criteria (SAC) of 300 mg/kg. Detection of the F4 (C₃₄-C₄₀) hydrocarbon fraction was also reported in Sample F-TP2 (230 mg/kg), however it was well below the SAC of 2,800 mg/kg). This sample was collected from an area currently utilised to store machinery. No other concentrations of BTEX, vTRH or sTRH were reported above the Laboratory LOR in any samples examined. Refer to **Table 9a** below:

Table 9a – Hydrocarbons in Soil – West Schofields Part Precinct (mg/kg)

SAMPLE	Depth (m)	Date	BTEX	Naphth	F1	F2	F3	F4		
			Site Acceptance Criteria (NEPM 2013) (HSL and ESL)							
			50-105	NL	180	120	300	2,800		
			Laboratory LOR (Envirolab)							
			0.2	1	25	50	100	100		
A-TP1	0.5	24/05/2016	ND	ND	ND	ND	ND	ND		
A-TP2	0.3	24/05/2016	ND	ND	ND	ND	ND	ND		
B-TP1	0.4	24/05/2016	ND	ND	ND	ND	ND	ND		
B-TP2	0.3	24/05/2016	ND	ND	ND	ND	ND	ND		
C-TP2	0.5	24/05/2016	ND	ND	ND	ND	ND	ND		
C-TP4	1	24/05/2016	ND	ND	ND	ND	ND	ND		
D-TP2	0.4	24/05/2016	ND	ND	ND	ND	ND	ND		
D-TP4	0.2	24/05/2016	ND	ND	ND	ND	ND	ND		
E-TP2	0.3	24/05/2016	ND	ND	ND	ND	ND	ND		
E-TP4	0.2	24/05/2016	ND	ND	ND	ND	ND	ND		
F-TP1	0.2	24/05/2016	ND	ND	ND	ND	ND	ND		
F-TP2	0.3	24/05/2016	ND	ND	ND	ND	480	230		
G-TP1	0.2	24/05/2016	ND	ND	ND	ND	ND	ND		
G-TP3	0.2	24/05/2016	ND	ND	ND	ND	ND	ND		
1m - 31	1m	1/07/2016	ND	ND	ND	ND	ND	ND		
0.5 - 31	0.5m	1/07/2016	ND	ND	ND	ND	ND	ND		
1.5 - 4	1.5m	1/07/2016	ND	ND	ND	ND	ND	ND		
0.5 - 4	0.5m	1/07/2016	ND	ND	ND	ND	ND	ND		
0.5 - 46	0.5m	1/07/2016	ND	ND	ND	ND	ND	ND		
0.2 - 46	0.2m	1/07/2016	ND	ND	ND	ND	ND	ND		

BOLD = exceedance of the thresholds prescribed by NEPM 2013 **ND** = Not Detected above Laboratory LOR **NL** = Non Limiting

Refer to **Figure 4** to **Figure 13** – Site Layout with Sampling Locations, **Appendix A** – Data Summary Table and **Appendix D** – NATA Certified Analytical Results.

9.1.2 Polycyclic Aromatic Hydrocarbons

All 21 samples were analysed for Polycyclic Aromatic Hydrocarbons (PAH) compounds. Results are summarised in **Table 9b** below. Detections of Benzo(a)Pyrene were reported above the Laboratory LOR in Sample D-TP2 (0.52 mg/kg), Sample G-TP1 (0.2 mg/kg), G-TP3 (0.3 mg/kg) and G-TP3 Bitumen

(0.05 mg/kg), however they were all below the relevant SAC (0.7 mg/kg). Detections of Benzo(a)Pyrene TEQ were reported above the Laboratory LOR in Sample D-TP2 (0.8 mg/kg), however it was below the SAC (3.0 mg/kg). Total PAH concentrations were detected above the laboratory LOR in Sample D-TP2 (3.7 mg/kg), Sample G-TP1 (1.1 mg/kg), G-TP3 (3.3 mg/kg) and G-TP3 Bitumen (0.05 mg/kg), however they were all within the relevant SAC (300 mg/kg). No other concentrations of PAHs were reported above the Laboratory LOR in any samples examined.

Table 9b – PAHs in Soil – West Schofields Part Precinct (mg/kg)

SAMPLE	Depth (m) bgl	Date	BaP	BaP TEQ	Total PAH
			Site Acceptance Criteria (NEPM 2013)		
			0.7	3.0	300
			Laboratory LOR (Envirolab)		
			0.05	0.5	N/A
A-TP1	0.5	24/05/2016	ND	ND	ND
A-TP2	0.3	24/05/2016	ND	ND	ND
B-TP1	0.4	24/05/2016	ND	ND	ND
B-TP2	0.3	24/05/2016	ND	ND	ND
C-TP2	0.5	24/05/2016	ND	ND	ND
C-TP4	1	24/05/2016	ND	ND	ND
D-TP2	0.4	24/05/2016	0.52	0.8	3.7
D-TP4	0.2	24/05/2016	ND	ND	ND
E-TP2	0.3	24/05/2016	ND	ND	ND
E-TP4	0.2	24/05/2016	ND	ND	ND
F-TP1	0.2	24/05/2016	ND	ND	ND
F-TP2	0.3	24/05/2016	ND	ND	ND
G-TP1	0.2	24/05/2016	0.2	ND	1.1
G-TP3	0.2	24/05/2016	0.3	ND	3.3
G-TP3- BITUMEN	-	24/05/2016	0.05	ND	0.05
1m - 31 south	1	1/07/2016	ND	ND	ND
0.5 - 31 south	0.5	1/07/2016	ND	ND	ND
1.5 - 4 Durham	1.5	1/07/2016	ND	ND	ND
0.5 - 4 Durham	0.5	1/07/2016	ND	ND	ND
0.5 - 46 Durham	0.5	1/07/2016	ND	ND	ND
0.2 - 46 Durham	0.2	1/07/2016	ND	ND	ND

BOLD = exceedance of the thresholds prescribed by NEPM 2013 **ND** = Not Detected above Laboratory LOR

Refer to **Figure 4** to **Figure 13** – Site Layout with Sampling Locations, **Appendix A** – Data Summary Table and **Appendix D** – NATA Certified Analytical Results.

9.1.3 Pesticides and Polychlorinated Biphenyls

Thirteen samples were analysed for Organochlorine (OC), Organophosphate (OP) pesticides and Polychlorinated Biphenyls (PCBs). There were no concentrations of OC or OP pesticides or PCBs reported above the Laboratory LOR.

9.1.4 Heavy Metals

Twenty samples were analysed for all eight heavy metals as recommended by the NSW EPA. Detections were observed for all heavy metals as shown in **Table 9c** below. All samples collected were compliant with the relevant HIL SAC for each respective analyte.

Table 9c – Heavy Metals in Soil – West Schofields Part Precinct (mg/kg)

SAMPLE	DEPTH (m) bgl	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
		Site Acceptance Criteria (NEPM 2013)							
		100	20	100	6,000	300	40	400	7,400
		Laboratory LOR (Envirolab)							
		4	0.4	1	1	1	0.1	1	1
A-TP1	0.5	ND	ND	8	6	13	ND	3	19
A-TP2	0.3	ND	ND	8	4	10	ND	3	6
B-TP1	0.4	ND	ND	11	10	13	ND	5	9
B-TP2	0.3	5	ND	11	17	16	ND	9	13
C-TP2	0.5	ND	ND	20	8	15	ND	3	8
C-TP4	1	4	ND	16	13	13	ND	5	10
D-TP2	0.4	6	ND	18	15	54	0.1	9	52
D-TP4	0.2	5	ND	13	10	24	ND	5	28
E-TP2	0.3	13	1	31	27	44	ND	8	150
E-TP4	0.2	7	ND	15	19	22	ND	6	98
F-TP1	0.2	10	0.5	25	16	29	ND	6	64
F-TP2	0.3	10	2	23	39	120	ND	10	220
G-TP1	0.2	6	ND	19	10	19	ND	6	34
G-TP3	0.2	6	ND	18	31	24	ND	13	140
1m - 31 south	1	ND	ND	5	4	3	ND	ND	3
0.5 - 31 south	0.5	6	ND	19	6	19	0.1	3	47
1.5 - 4 Durham	1.5	ND	ND	5	9	6	ND	2	7
0.5 - 4 Durham	0.5	7	ND	18	13	12	ND	2	31
0.5 - 46 Durham	0.5	8	ND	20	24	21	ND	9	37
0.2 - 46 Durham	0.2	6	ND	14	18	21	ND	8	38

BOLD = exceedance of the thresholds prescribed by NEPM 2013 **ND** = Not Detected above Laboratory LOR

Refer to **Figure 4 to Figure 13 – Site Layout with Sampling Locations**, **Appendix A – Data Summary Table** and **Appendix D – NATA Certified Analytical Results**.

9.1.5 Asbestos

Bonded ACM fragments were visually identified and confirmed by laboratory analysis in five locations Property E – TP3 (Path containing crushed building material), Property E – TP4 (Rubbish stockpile in western area of property), Property F – TP1 (surface fragments in western area of property), Property

F – TP2 (surface fragments in western area of property) and Property I – ACM (surface fragments in western area of property).

Three bulk samples were also collected from the path containing crushed building material (Property E – TP3) and the rubbish stockpile (Property E – TP4) and the soils underlying the asbestos fragments on 4 Durham Road (Property I). Visible asbestos fragments were identified on the surface soils in all three locations during sample collection. Following analysis, asbestos was reported in sample Property E – TP3 and sample 4 Durham Road.

No samples reported the presence of asbestos fines/fibrous asbestos (AF/FA).

Refer to **Appendix A** – Data Summary Table and **Appendix D** – NATA Certified Analytical Results.

9.2 **Groundwater Results**

9.2.1 **Monocyclic Aromatic Hydrocarbons, Volatile Total Recoverable Hydrocarbons and Semi Volatile Total Recoverable Hydrocarbons**

Two water samples collected from the Site were analysed for Monocyclic Aromatic Hydrocarbons (BTEX fractions), Volatile Total Recoverable Hydrocarbons (vTRH) and Semi Volatile Total Recoverable Hydrocarbons (TRH). No samples were reported to have concentrations of BTEX, vTRH or sTRH above the laboratory LOR.

Refer to **Figure 2** – Site Layout with Sampling Locations, **Appendix A** – Data Summary Table and **Appendix D** – NATA Certified Analytical Results.

9.2.2 **Polycyclic Aromatic Hydrocarbons**

Two groundwater samples collected at the Site were analysed for Polycyclic Aromatic Hydrocarbons (PAHs). No detections for PAHs were reported above the Laboratory LOR in either of the two samples analysed.

9.2.3 **Heavy Metals**

Three groundwater samples were analysed for all eight heavy metals as recommended by the NSW EPA (NEPM 2013). Detections were observed for all heavy metals with the exception of Chromium, Lead and Mercury.

Analysis of Sample BH01 reported the following exceedances of GIL Thresholds prescribed by the NEPM 2013:

- A concentration of Nickel (18 µg/L), exceeding the GIL thresholds (11 µg/L); and,
- A concentration of Zinc (53 µg/L), exceeding the GIL thresholds (8 µg/L).

Analysis of Sample BH02 reported the following exceedances of GIL Thresholds prescribed by the NEPM 2013:

- A concentration of Cadmium (0.4 µg/L), exceeding the GIL thresholds (0.2 µg/L);
- A concentration of Nickel (57 µg/L), exceeding the GIL thresholds (11 µg/L); and,
- A concentration of Zinc (41 µg/L), exceeding the GIL thresholds (8 µg/L).

Analysis of Sample BH03 reported the following exceedances of GIL Thresholds prescribed by the NEPM 2013:

- A concentration of Cadmium (0.3 µg/L), exceeding the GIL thresholds (0.2 µg/L);
- A concentration of Nickel (26 µg/L), exceeding the GIL thresholds (11 µg/L); and,
- A concentration of Zinc (33 µg/L), exceeding the GIL thresholds (8 µg/L).

All other concentrations were within the NEPM 2013 GIL – Fresh Waters Criteria for each respective analyte. Refer to **Table 9d** below:

Table 9d – Heavy Metals Results (µg/L) – GIL (Freshwater)

SAMPLE NAME	ANALYTES							
	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
	Site Acceptance Criteria (µg/L) (ANZECC 2000; NEPM 2013)							
	24	0.2	1.0	1.4	3.4	0.06	11	8
Laboratory LOR (Envirolab)								
	1	0.1	1	1	1	0.05	1	1
BH01	1	0.1	ND	1	ND	ND	18	53
BH02	ND	0.4	ND	ND	ND	ND	57	41
BH03	ND	0.3	ND	1	ND	ND	26	33

BOLD = exceedance of the thresholds prescribed by NEPM 2013. **ND** = Not Detected above Laboratory LOR

Refer to **Figure 2 – Site Layout with Sampling Locations**, **Appendix A – Data Summary Table** and **Appendix D – NATA Certified Analytical Results**.

9.3 QA/QC Comments

Laboratory QA/QC on all samples analysed included calculation of relative percentage difference (%RPD), matrix spike recovery and blank determinations. All matrix spike recovery and blank determinations were within acceptable limits. Therefore, it is considered that sampling techniques and transportation of samples were appropriate. An intra-laboratory duplicate rate of 9.5% was achieved, less than the 10% required by the Field Quality Plan. An inter-laboratory duplicate rate of 4.8% was achieved, less than the 5% required by the Field Quality Plan. The results of the inter-laboratory and intra-laboratory duplicates examined indicate compliance with QA/QC procedure. Laboratory Duplicates were tested to ensure the results meet the requirements of QA/QC. The %RPD for the majority of intra-laboratory and inter-laboratory duplicates had concentrations that complied with the criteria set for acceptable RPDs and where exceedances were noted, the heterogeneity observed in the duplicate samples was not deemed significant enough to diminish confidence in the sampling technique or laboratory results.

Refer to **Appendix E – Quality Assurance and Quality Control**.

10.0 DISCUSSION

Following the completion of relevant background searches, historical aerial photography review and Site walkover a total of 17 Areas of Environmental Concern (AEC) were identified within the Part Precinct area. Several of the areas identified contained multiple lots, grouped together due to a similar historical land use. Two offsite influences, including the former Grange Avenue Landfill and the Townson Road Landfill, were also identified directly adjacent to the Part Precinct area. Refer to **Section 5.0** and **Figure 3** for a full summary of AECs. A total of ten AECs were assessed via a visual site assessment (walk over) during the investigation with soil, groundwater and asbestos samples collected from targeted areas. The remaining AECs were unable to be accessed during the assessment and will require further investigation during the Detailed Environmental Site Assessment.

A DESA was completed on Part Lot 3 in DP 232574 (DLA, 2012), currently occupied by the CSR Brick factory and associated former quarry area. The 500,000m² (50Ha) parcel of land is situated directly north of Townson/Meadow Road within the Part Precinct. No groundwater contamination was identified to be present on Site with no further investigation for groundwater required. It should be noted that existing conditions apply to the Site for groundwater monitoring around the Landfill Stockpile as part of the landfill stockpile management plan. The remainder of the Lot south east of Meadow Road requires no further contamination investigation.

Further investigations were recommended for the brick factory, sales and display centre and associated hardstand storage areas to develop a better understanding of potential soil contamination, including investigation in to the USTs that were located on Site. Asbestos remediation of the stockpile bund along the eastern length of the Site and PAH hotspot remediation within the eastern bund and landfill stockpile were also recommended. It is recommended works to remediate the identified hotspot areas are undertaken in accordance with the NSW EPA Site Auditor Scheme to make the Site suitable for an end land use, consistent with NEPM 2013 Residential A - Residential with Garden / Accessible soils.

Site inspections were undertaken on the 24th May 2016 and 1st July 2016. Overall the Part Precinct consists of predominantly rural land with open paddocks, rural residential housing and remnant bushland vegetation. There are several properties which appear to have sheds and machinery present. There is a Nursery present on 9 Townson Road (Lot 43 DP 1175138), bordering Bells Creek with vehicles and machinery stored at the rear of the property. Several market gardens are located throughout the Durham, Jersey and Kerry road areas.

On 24th May 2016 a total of seven properties were inspected with a total of 32 Test Pits Excavated and samples collected for chemical and salinity analysis. On 1st July 2016 a total of three properties were

inspected with a total of three boreholes augured, with samples collected for chemical analysis and three groundwater monitoring wells installed.

A total of 21 soil samples were collected for chemical analysis from the 10 identified properties. No detections above the laboratory Limit of Reporting (LOR) were reported for BTEX, volatile-Total Recoverable Hydrocarbons, Organochlorine or Organophosphorus pesticides.

An exceedance of the ESL Site Assessment Criteria (SAC) for the F3 Hydrocarbon fraction (300 mg/kg) was reported following analysis of Sample F-TP2 (480 mg/kg). The sample collection area is consistent with several of the properties investigated within the part precinct which were observed to contain machinery stored within the paddock and yard areas. These were observed to contain hydrocarbon staining and are within AEC 2, AEC 3, AEC 4 and AEC 9 following the Site inspection and AEC 5 from the desktop investigation. It is recommended that following the removal of the machinery all areas containing hydrocarbon staining are scraped on the surface with the soils appropriately classified by an environmental consultant. All other soil samples collected at the Site were reported to be compliant with the relevant SAC for BTEX, Volatile Total Recoverable Hydrocarbons (vTRH), Semi-Volatile TRH (sTRH), Polycyclic Aromatic Hydrocarbons, and Heavy Metals.

No groundwater samples collected from the Site were reported to have concentrations of BTEX, vTRH, sTRH or PAHs above the laboratory LOR. Exceedances of the NEPM 2013 Fresh Waters criteria were observed for Nickel and Zinc in all three groundwater samples analysed and for Chromium in BH02 and BH03. Groundwater in all samples was observed to be saline (electric conductivity of 5.1, 18 and 26 mS/cm). The reported exceedances of the NEPM 2013 GIL – Fresh Waters criteria were considered to be consistent with regional groundwater quality in the vicinity of the Site and not likely to pose a significant risk to human health as the saline groundwater is unlikely to be used for potable water.

Bonded ACM fragments were visually identified and confirmed by laboratory analysis in five locations Property E – TP3, Property E – TP4, Property F – TP1, Property F – TP2 and Property I – ACM. Asbestos in soils was observed and confirmed by laboratory analysis in in sample Property E – TP3 and sample 4 Durham Road (on property I). No samples reported the presence of asbestos fines/fibrous asbestos (AF/FA).

Several areas have been identified as requiring remediation or further investigation regarding asbestos contamination and are summarised below:

- Removal of asbestos fragments found on the ground surface on Property F (within AEC 9) should be undertaken by a licenced asbestos removalist. The area will then need to be validated by a licenced asbestos assessor;

- The asbestos fragments found on the found surface on Property I and on Lot 36 DP12076 (within AEC 11) should be further investigated to determine the extent of the asbestos in the underlying soils;
- The crushed building material paths on Property E (within AEC 13) should be further investigated to determine the extent of the Asbestos Containing Material (ACM) present within the path network of the market garden;
- The rubbish stockpile on Property E should be spread out and hand-picked by a licenced asbestos removalist. The area will then need to be validated by a licenced asbestos assessor.

Two offsite influences located within the direct vicinity of the Part Precinct include the Grange Avenue Landfill and Lot 1029 DP1191448 south of Townson Road. Both sites were utilised as landfills from approximately 1970-2000. It is recommended that investigation occurs into the potential for Landfill Gas (LFG) migration onto the Site.

11.0 CONCLUSION

The sampling regime and subsequent assessment and reporting of the Site are considered to be adequate for assessment purposes to determine the future land use suitability of the Subject Site in accordance with Blacktown City Council, relevant Development Consent Conditions and the general requirements of State Environmental Planning Policy No.55 (SEPP 55). All reporting has been undertaken in accordance with the *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA, 2011) and the *Guidelines for the NSW Site Auditor Scheme* (NSW EPA, 2nd ed., 2006). A total of 17 Areas of Environmental Concern (AEC) were identified within the Part Precinct during this investigation and ten of these were sampled. The remaining AECs were unable to be accessed during the assessment and will require further investigation during the Stage 2 – Detailed Environmental Site Assessment. In addition, additional sampling within the AECs assessed in this investigation will also be required, as in some AECs there were multiple lots that were not all sampled.

With the exception of the identified the minor hydrocarbon contamination within the areas utilised for machinery storage, the remaining areas of further investigation and the identified remediation strategy for part Lot 3 DP232574, there are no indications of chemical contamination by petroleum hydrocarbons, PAH, pesticides, PCBs or Heavy Metals at the Site. The remediation or further investigation of the asbestos containing materials (ACM) identified within AEC 9, AEC 11 and AEC 13 will also need to occur. Any demolition of sheds or dwellings identified to contain ACM will require works to be undertaken under asbestos conditions and require an asbestos clearance at the completion of works. These works will require the removal of surface soils below the footprint of the building.

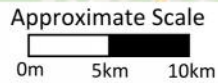
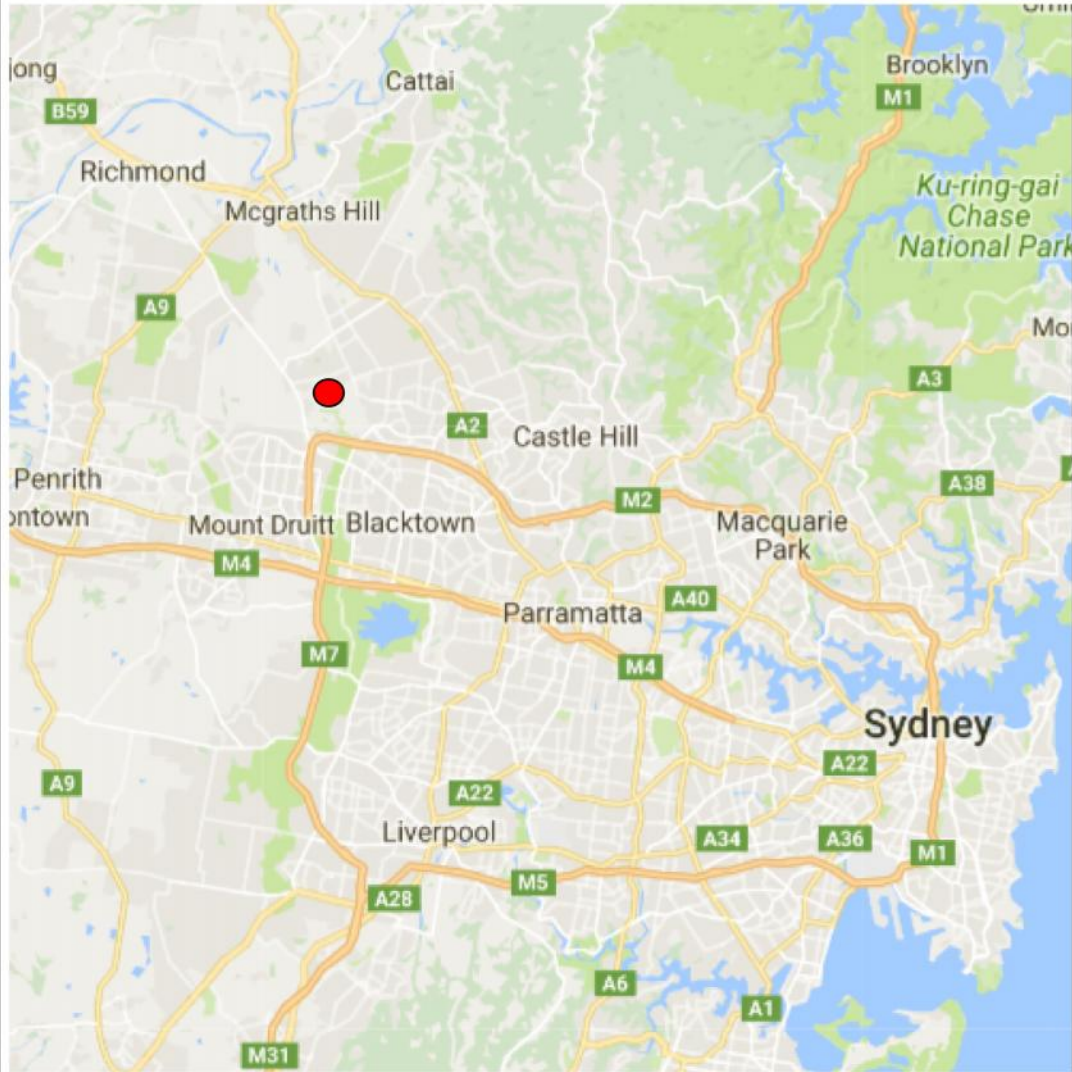
It is therefore the opinion of DLA that the Site assessment objectives of this report have been achieved. The PESA concludes that the Site is considered suitable for the intended land use consistent with NEPM (NEPC, 2013) *Residential A – Residential with Garden / Accessible soil*, with the exception of the three identified areas. These areas of the Site can be made suitable through the removal of the fill materials and a subsequent asbestos clearance / validation report or further investigation within the Detailed Environmental Site Assessment.

12.0 REFERENCES

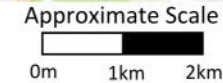
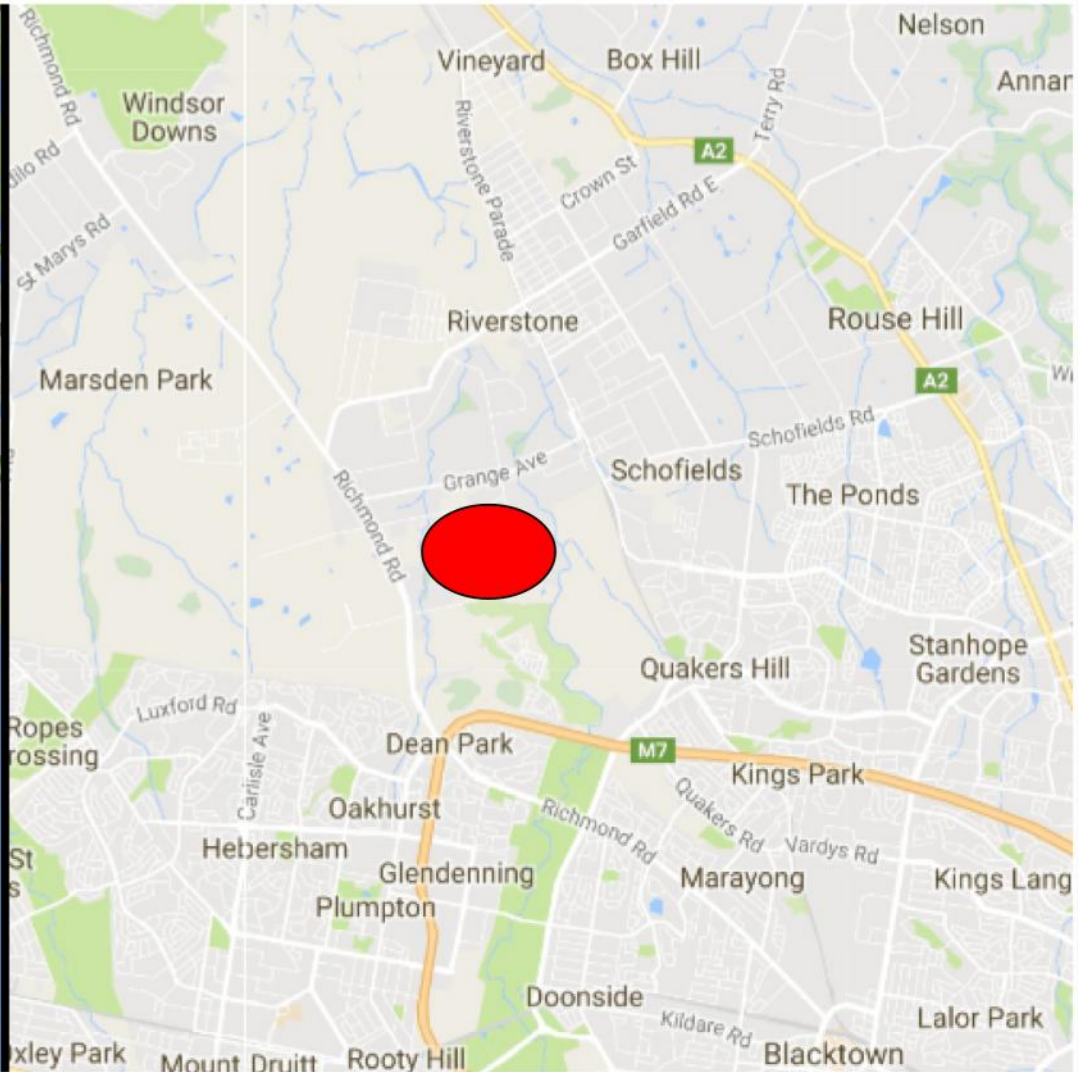
- *Australian and New Zealand Guidelines for the Management of Contaminated Sites* (ANZECC/NHMRC 1992);
- *Australia and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC, 2000);
- *Australian Drinking Water Guidelines, National Water Quality Management Strategy 2011*;
- Chapman, G A, Murphy, C L, Tille, P J, Atkinson, G and Morse, R J, *Sydney Soil Landscapes Map, Series 9130* (1989);
- *Code of Practice for the Safe Removal of Asbestos* (NOHSC, 2nd eds, 2005);
- *Contaminated Land Management Act 1997* (NSW);
- *Contaminated Sites: Assessing Service Station Sites, 1994* (NSW EPA, 1994);
- *Contaminated Site: Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA, 2011);
- *Contaminated Sites: Guidelines on Duty to Report Contamination under the Contamination Land Management Act 1997* (NSW DECC, 2009);
- *Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination* (NSW DEC, 2007);
- *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme* (NSW EPA, 2nd ed., 2006);
- *Contaminated Sites: Guidelines on Significant Risk of Harm from Contaminated Land and the Duty to Report* (NSW EPA 1999);
- *Contaminated Sites: Sampling Design Guidelines* (NSW EPA 1995);
- *Environmental Guidelines: Solid Waste Landfills* (NSW EPA, 1996);
- *Guidelines for the Assessment of On-Site Containment of Contaminated Soil* (ANZECC, 1999).
- *Health - Based Soil Investigation Levels, Imray, P & Langley, A, National Environmental Health Forum Monographs, Soil Series No. 2 (2nd Ed), South Australian Health Commission* (NEHF 1998b);
- *How to Safely Remove Asbestos: Code of Practice* (WorkCover, 2011);
- *National Environment Protection (Assessment of Site Contamination) Measure (No.1)* (NEPC, 2013);
- *Managing Land Contamination: Planning Guidelines, SEPP 55 - Remediation of Land* (DUAP, 1998);
- *Storage and Handling of Dangerous Goods Code of Practice 2005*;
- *Pacific Southwest, Region 9 Regional Screening Levels* (US EPA, 2014);
- *Schofields Rd Stage 3 Contaminated Land Management and Geotechnical Investigation Report* (Parsons Brinkerhoff, on behalf of RMS, August 2012);
- *Waste Avoidance and Resource Recovery Act 2001* (NSW);
- *Waste Classification Guidelines* (NSW EPA, 2014); and,
- *Work Health and Safety Act 2011* (NSW) and associated regulations.

FIGURE 1 – SITE LOCATION

REGIONAL



LOCAL



Legend
 Site Location



DLA
 DLA Environmental Services
 A Pacific Environment company

Sydney Office
 Phone (02) 9476 1765
 Fax (02) 9476 1557

Maitland Office
 Phone (02) 4933 0001

Title Site Location - Regional and Local			
Client Calibre Consulting Pty Ltd	Project No. DL3788	Figure No 1	Date 20/07/2016
Scale As Shown	Compiled JM	Revision R00	

FIGURE 2 – SITE LAYOUT



Legend

Site Boundary



Approximate Scale



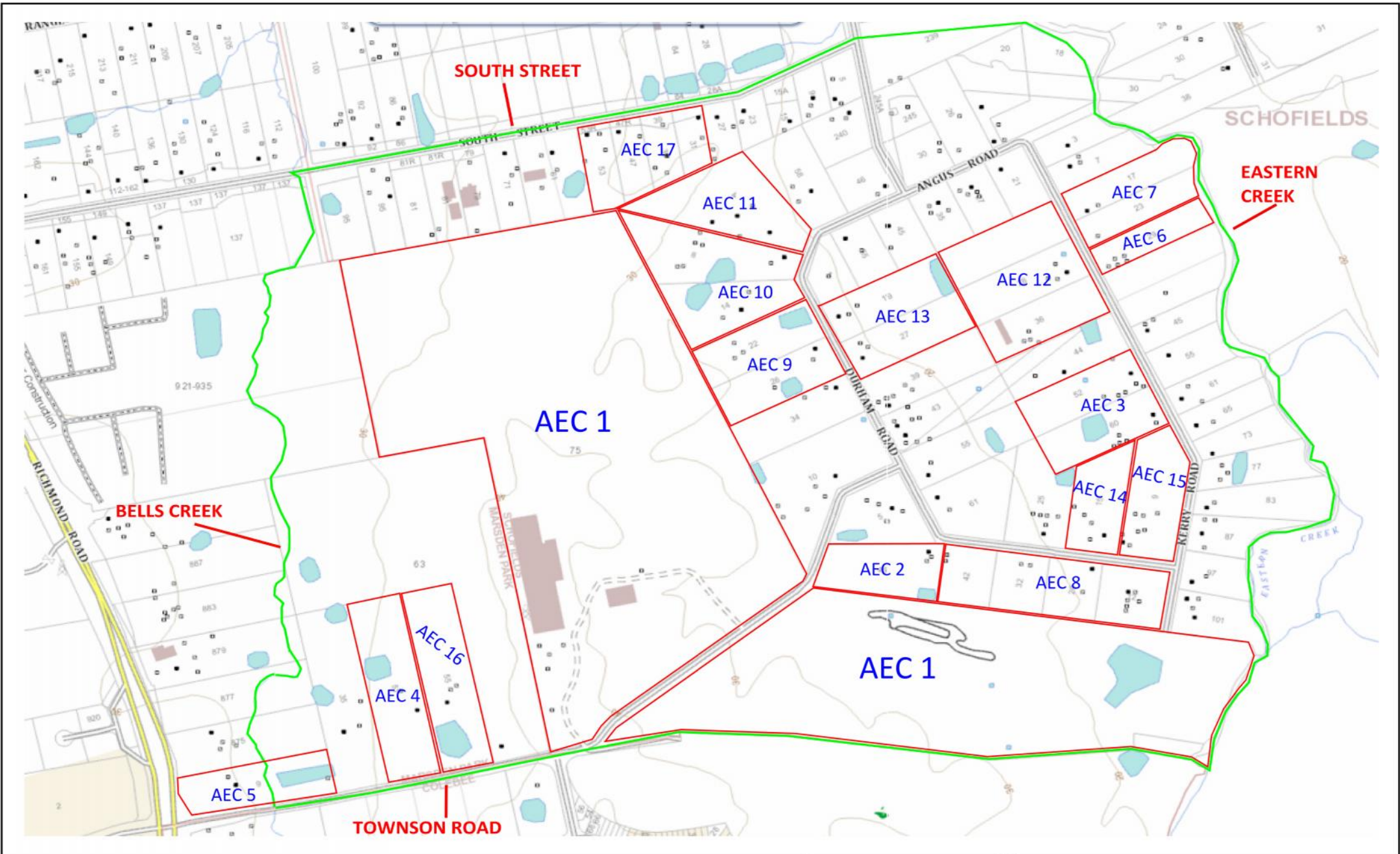
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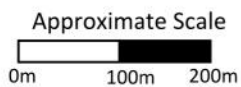
Title
Site Layout

Client Calibre Consulting	Project No. DL3788	Figure No. 2	Date 20/06/2016
Scale As Shown	Compiled JM	Revision R00	

FIGURE 3 – AREAS OF ENVIRONMENTAL CONCERN



- Legend**
- AEC Number
 - Site Boundary
 - AEC Boundary



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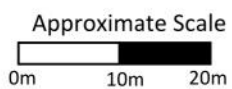
Title Areas of Environmental Concern			
Client Calibre Consulting	Project No. DL3788	Figure No. 3	Date 20/06/2016
Scale As Shown	Compiled JM	Revision R00	

FIGURE 4 – PROPERTY A – SITE LAYOUT WITH SAMPLING LOCATIONS



Legend

- Test Pit Location
- AEC From Aerial Photograph Review
- Property Boundary



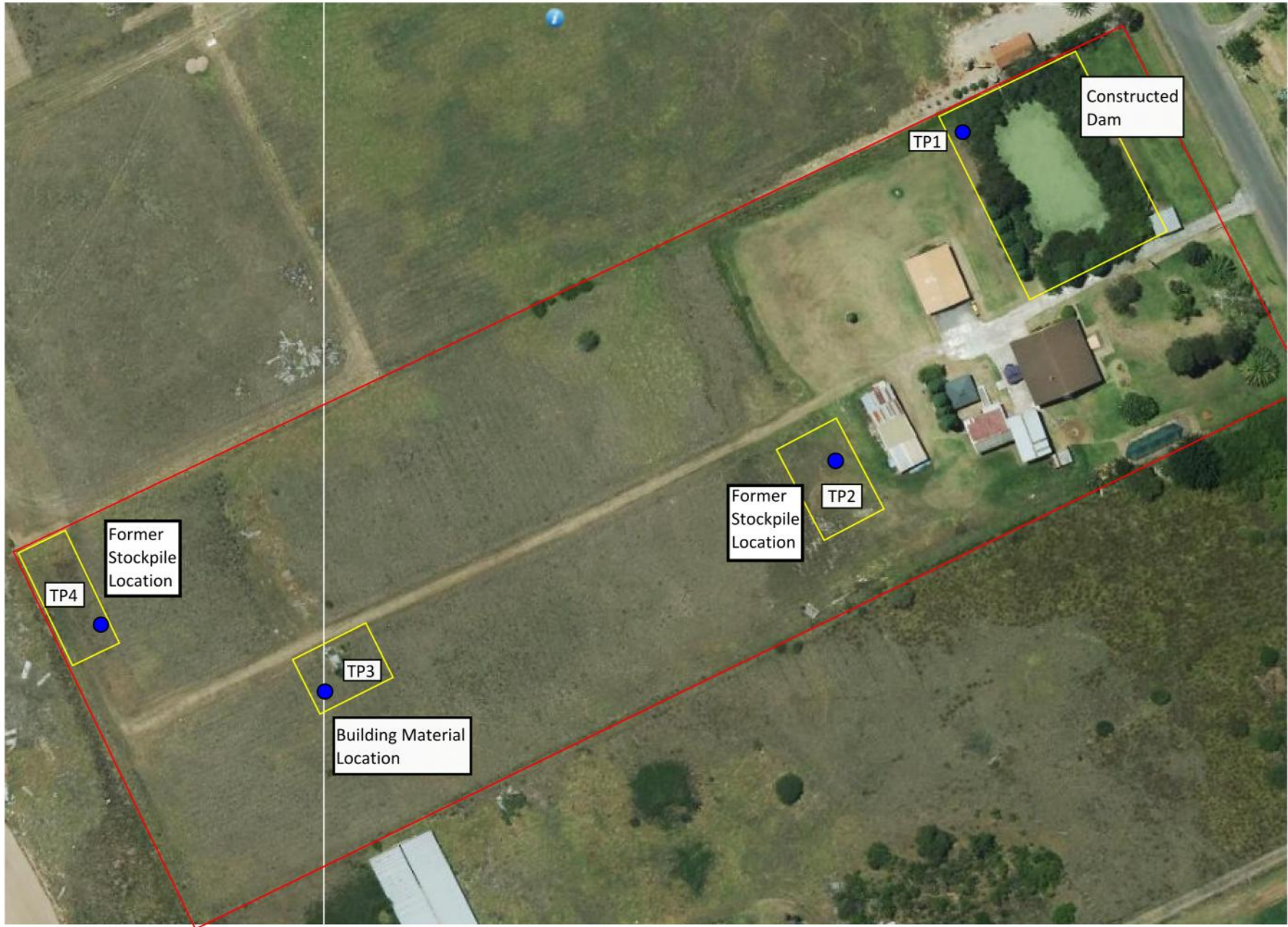
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Maitland Office
Phone (02) 4933 0001

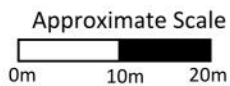
Title Property A - Site Layout with Sampling Locations			
Client Calibre Consulting	Project No. DL3788	Figure No. 4	Date 30/06/2016
Scale As Shown	Compiled JM	Revision R00	

FIGURE 5 – PROPERTY B – SITE LAYOUT WITH SAMPLING LOCATIONS



Legend

- Test Pit Location
- AEC From Aerial Photograph Review
- Property Boundary



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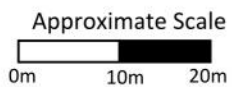
Title Property B - Site Layout with Sampling Locations			
Client Calibre Consulting	Project No. DL3788	Figure No 5	Date 30/06/2016
	Scale As Shown	Compiled JM	Revision R00

FIGURE 6 – PROPERTY C – SITE LAYOUT WITH SAMPLING LOCATIONS



Legend

- Test Pit Location
- AEC From Aerial Photograph Review
- Property Boundary



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Maitland Office
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Title Property C - Site Layout with Sampling Locations			
Client Calibre Consulting	Project No. DL3788	Figure No 6	Date 30/06/2016
	Scale As Shown	Compiled JM	Revision R00

FIGURE 7 – PROPERTY D – SITE LAYOUT WITH SAMPLING LOCATIONS



Legend

- Test Pit Location
- AEC From Aerial Photograph Review
- Property Boundary



Approximate Scale
 0m 10m 20m

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 Phone (02) 4933 0001

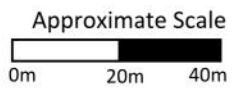
Title Property D - Site Layout with Sampling Locations			
Client Calibre Consulting	Project No. DL3788	Figure No. 7	Date 30/06/2016
Scale As Shown	Compiled JM	Revision R00	

FIGURE 8 – PROPERTY E – SITE LAYOUT WITH SAMPLING LOCATIONS



Legend

- Test Pit Location
- AEC From Aerial Photograph Review
- Property Boundary



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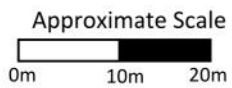
Title Property E - Site Layout with Sampling Locations			
Client Calibre Consulting	Project No. DL3788	Figure No. 8	Date 30/06/2016
Scale As Shown	Compiled JM	Revision R00	

FIGURE 9 – PROPERTY F – SITE LAYOUT WITH SAMPLING LOCATIONS



Legend

- Test Pit Location
- AEC From Aerial Photograph Review
- Property Boundary



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Phone (02) 4933 0001

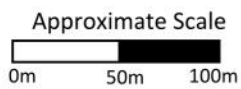
Title Property F - Site Layout with Sampling Locations			
Client Calibre Consulting	Project No. DL3788	Figure No. 9	Date 30/06/2016
Scale As Shown	Compiled JM	Revision R00	

FIGURE 10 – PROPERTY G – SITE LAYOUT WITH SAMPLING LOCATIONS



Legend

- Test Pit Location
- AEC From Aerial Photograph Review
- Property Boundary



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Maitland Office
Phone (02) 4933 0001

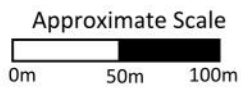
Title Property G - Site Layout with Sampling Locations			
Client Calibre Consulting	Project No. DL3788	Figure No. 10	Date 30/06/2016
	Scale As Shown	Compiled JM	Revision R00

FIGURE 11 – PROPERTY H – SITE LAYOUT WITH SAMPLING LOCATIONS



Legend

- Test Pit Location
- AEC From Aerial Photograph Review
- Property Boundary



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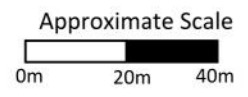
Title Property H - Site Layout with Sampling Locations			
Client Calibre Consulting	Project No. DL3788	Figure No 11	Date 10/07/2016
	Scale As Shown	Compiled JM	Revision R00

FIGURE 12 – PROPERTY I – SITE LAYOUT WITH SAMPLING LOCATIONS



Legend

- Test Pit Location
- AEC following Site Inspection
- Property Boundary



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Title Property F - Site Layout with Sampling Locations			
Client Calibre Consulting	Project No. DL3788	Figure No 13	Date 20/07/2016
	Scale As Shown	Compiled JM	Revision R00

FIGURE 13 – PROPERTY J – SITE LAYOUT WITH SAMPLING LOCATIONS



Legend

- Test Pit Location
- Property Boundary



Approximate Scale
 0m 10m 20m

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Title Property F - Site Layout with Sampling Locations			
Client Calibre Consulting	Project No. DL3788	Figure No. 13	Date 26/07/2016
	Scale As Shown	Compiled JM	Revision R00

APPENDIX A – DATA SUMMARY TABLE

SOILS AND ASBESTOS

WATER



NEM (NEPC 2013)
Groundwater Investigation Levels
Freshwater Criteria (ug/L)

950 GIL

N/A

N/A

350 (As O) 200 (As P) GIL

N/A

N/A

N/A

N/A

N/A

300 NETHERLANDS MPC

N/A

DDT+DDD+DDE

Aldrin+Dieldrin

Chlordane

Endosulfan

Ethrin

Heptachlor

HCB

Methoxychlor

24 (As III) 13 (As V) GIL

0.2 GIL

1.0 (As V) GIL

3.4 GIL

3.4 GIL

0.06 GIL

11 GIL

8 GIL

6.5 - 8.5 ANZECC95% (freshwater)

Sample ID	Depth (m)	Date	Chemical Report	Description	Comment	BTEX - Sandy soils				TRH - Sandy soils				TRH Total	PAH BaP TEQ	PAH Total	Pesticides										PCB	Heavy Metals						pH	Electrical Conductivity (µs/cm)	
						Benz	Toluene	EthylBe	Xylene	Naph	F1	F2	F3				F4	OC					OP	As	Cd	Cr VI		Cu	Pb	Hg	Ni	Zn				
BH01	N/A	12/07/2016	150045	water		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	0.1	ND	1	ND	ND	18	53	6.8	26000
BH02	N/A	12/07/2016	150045	water		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	0.4	ND	ND	ND	ND	57	41	6.4	5100	
BH03	N/A	12/07/2016	150045	water		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3	ND	1	ND	ND	26	33	6.4	18000	

INTRA-LABORATORY DUPLICATES
INTER-LABORATORY DUPLICATES
STATISTICAL ANALYSIS

Min						0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.1	0.0	1.0	0.0	0.0	18.0	33.0	6.4	5100.0	
Max						0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.4	0.0	1.0	0.0	0.0	57.0	53.0	6.8	26000.0	
Avg						#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.0	0.3	#DIV/0!	1.0	#DIV/0!	#DIV/0!	33.7	42.3	6.5	16366.7	
Stdev						#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.2	#DIV/0!	0.0	#DIV/0!	#DIV/0!	#DIV/0!	20.6	10.1	0.2	10545.3	
95% UCL																																				

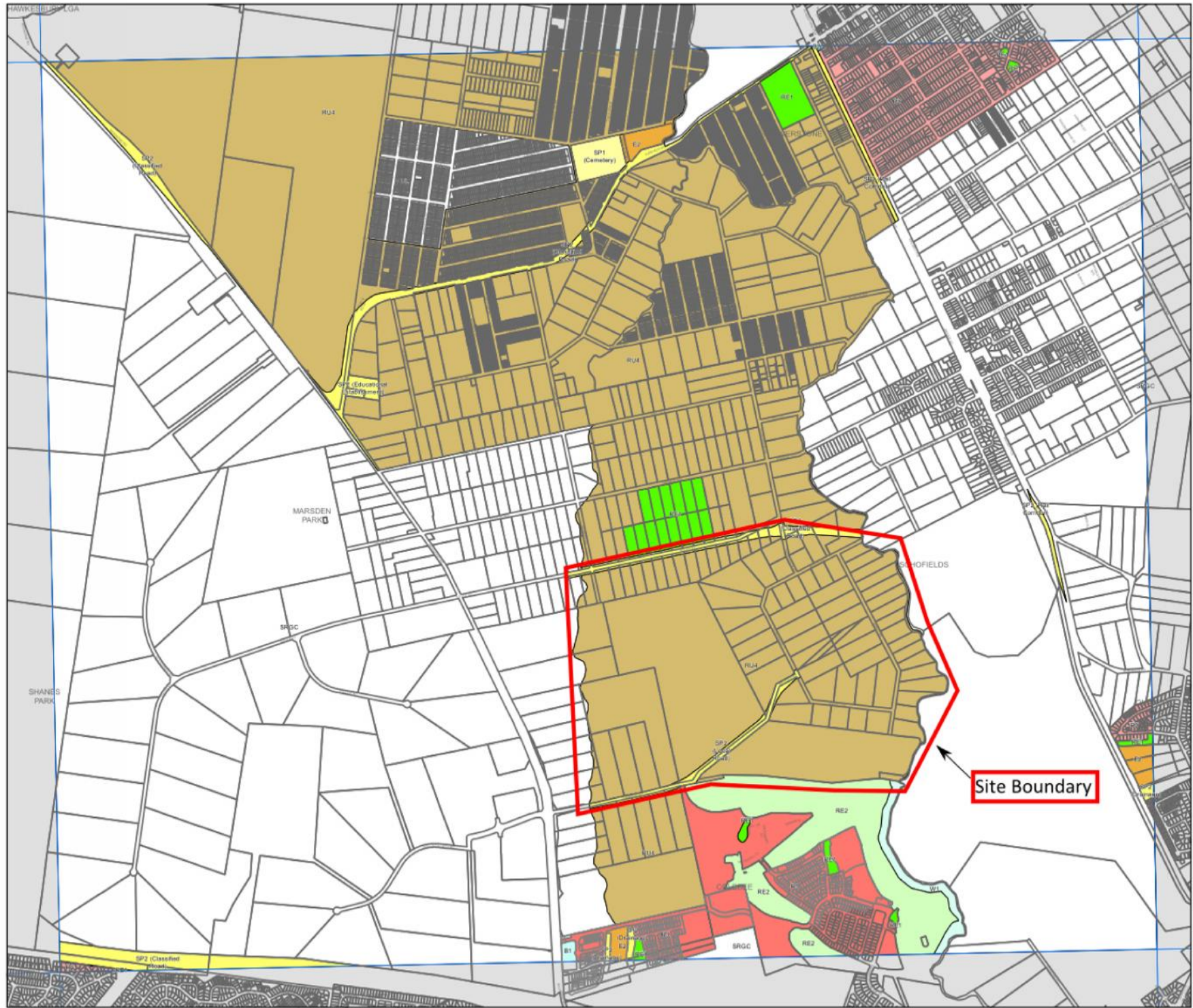
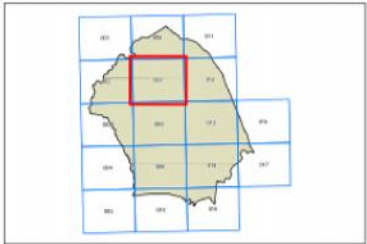
* Depth relates to Depth Below Surface Level -- Not Tested nd = Not Detected Above Laboratory LOR NL = Not Limits Bold = Detected Above Laboratory LOR

APPENDIX B – BLACKTOWN LEP (2012) ZONING MAP

Land Zoning Map - Sheet LZN_007

- Zone**
- B1 Neighbourhood Centre
 - B2 Local Centre
 - B3 Commercial Core
 - B4 Mixed Use
 - B5 Business Development
 - B7 Business Park
 - E2 Environmental Conservation
 - E3 Environmental Management
 - IN1 General Industrial
 - IN2 Light Industrial
 - R1 General Residential
 - R2 Low Density Residential
 - R3 Medium Density Residential
 - R4 High Density Residential
 - RE1 Public Recreation
 - RE2 Private Recreation
 - RU4 Primary Production Small Lots
 - SP1 Special Activities
 - SP2 Infrastructure
 - W1 Natural Waterways
 - UL Unzoned Land
 - SRGC SEPP (Sydney Region Growth Centres) 2006
 - SRGP Sydney Regional Environmental Plan 30 - St Marys
 - WSP SEPP (Western Sydney Parklands) 2009

- Cadastre**
- Cadastre 28/03/2014 © Blacktown City Council
 - Cadastre Addendum 12/03/2015 © Colebee Area



APPENDIX C – PART PRECINCT LOTS

Part Lots East of Bell Creek				Entire Lots			
Lot	Section	DP	Address	Lot	Section	DP	Address
43		1175138	9 Townson Road, marsden park	16		1096480	95 South Street, Schofields
41		1175138	879 Richmond Road, marsden park	2		115178	71 South Street, Schofields
42		1175138	877 Richmond Road, marsden park	111		787965	61 South Street, Schofields
6		17048	875 Richmond Road, marsden park	110		787965	61 South Street, Schofields
20		1190560	883 Richmond Road, marsden park	5	h	193074	27 South Street, Schofields
11		17048	63 Townson Road, marsden park	4	h	193074	23 South Street, Schofields
10		17048	55 Townson Road, marsden park	40		12076	46 Angus Road, Schofields
9		17048	51 Townson Road, marsden park	38		12076	58 Angus Road, Schofields
8		17048	35 Townson Road, marsden park	37		12076	4 Durham Road, Schofields
17		1190560	921-935 Richmond Road, marsden park	36		12076	8 Durham Road, Schofields
16		1190560	921-935 Richmond Road, marsden park	35		12076	14 Durham Road, Schofields
8		1206952	137 South Street, marsden park	34		12076	22 Durham Road, Schofields
9		1206952	137 South Street, marsden park	33		12076	26 Durham Road, Schofields
18		1206952	137 South Street, marsden park	32		12076	34 Durham Road, Schofields
				100		583063	10 Meadow Road, Schofields
				3		232574	75 Townson Road, Schofields
				29		12076	5 Meadow Road, Schofields
				39		12076	240 Carnarvon Road, Schofields
				28		12076	46 Durham Road, Schofields
				100		1207777	95 South Street, Schofields
				102		1207777	81 South Street, Schofields
				125		1207777	81R South Street, Schofields
				124		1207777	81R South Street, Schofields
				103		1207777	81R South Street, Schofields
				73		1210436	79 South Street, Schofields
				71		1210436	79 South Street, Schofields
				108		1207777	53 South Street, Schofields
				119		1207777	53R South Street, Schofields
				109		1207777	47 South Street, Schofields
				118		1207777	47R South Street, Schofields
				110		1207777	39 South Street, Schofields
				117		1207777	39 South Street, Schofields
				500		1214310	31 South Street, Schofields
				501		1214310	South Street, Schofields
				75		1206174	15A South Street, Schofields
				71		1206174	15 South Street, Schofields
				2	h	193074	9 South Street, Schofields
				1	h	193074	5 South Street, Schofields
				5		1205591	20 angus Road, Schofields
				11		1205591	angus Road, Schofields
				3		12076	26 angus Road, Schofields
				8		1205591	245A Carnarvon Road, Schofields
				2		1205591	245 Carnarvon Road, Schofields
				9		1205591	Carnarvon Road, Schofields
				3		1205591	30 angus Road, Schofields
				27		12076	42 Jersey Road, Schofields
				26		12076	32 Jersey Road, Schofields
				25		12076	20 Jersey Road, Schofields
				24		12076	24 Jersey Road, Schofields
				D		376106	9 Jersey Road, Schofields
				C		376106	15 Jersey Road, Schofields
				B		376106	25 Jersey Road, Schofields
				A		376106	61 Durham Road, Schofields
				58		12076	55 Durham Road, Schofields
				590		815588	43 Durham Road, Schofields
				591		815588	Durham Road, Schofields
				592		815588	Durham Road, Schofields
				61		12076	27 Durham Road, Schofields
				60		12076	39 Durham Road, Schofields
				62		12076	19 Durham Road, Schofields
				41		12076	1 Durham Road, Schofields
				42		12076	55 angus Road, Schofields
				43		12076	45 angus Road, Schofields
				44		12076	35 angus Road, Schofields
				45		12076	27 angus Road, Schofields
				46		12076	21 angus Road, Schofields
				47		12076	Kerry Road, Schofields
				48		12076	28 Kerry Road, Schofields
				49		12076	36 Kerry Road, Schofields
				500		1035546	44 Kerry Road, Schofields
				501		1035546	-
				502		1035546	Kerry Road, Schofields
				51		12076	52 Kerry Road, Schofields
				52		12076	60 Kerry Road, Schofields
				37		752030	-
				8		12076	7 Kerry Road, Schofields
				9		12076	17 Kerry Road, Schofields
				10		12076	23 Kerry Road, Schofields
				11		12076	29 Kerry Road, Schofields
				14		12076	45 Kerry Road, Schofields
				13		12076	Kerry Road, Schofields
				12		12076	Kerry Road, Schofields
				19		12076	77 Kerry Road, Schofields
				18		12076	73 Kerry Road, Schofields
				17		12076	65 Kerry Road, Schofields
				22		12076	97 Kerry Road, Schofields
				21		12076	87 Kerry Road, Schofields
Part Lots West of Eastern Creek							
8		27259	239 Carnarvon Road, Schofields				
400		1171596	Nirimba dr, Schofields				
4		1191977	Bridge Street, Schofields				
23		12076	101 Kerry Road, Schofields				
20		12076	83 Kerry Road, Schofields				
16		12076	61 Kerry Road, Schofields				
15		12076	55 Kerry Road, Schofields				
7		12076	3 Kerry Road, Schofields				
12		1205591	angus Road, Schofields				
6		1205591	18 angus Road, Schofields				

APPENDIX D – NATA CERTIFIED ANALYTICAL RESULTS



CERTIFICATE OF ANALYSIS

147388

Client:

DLA Environmental Services Pty Ltd (Maitland)
42B Church St
Maitland
NSW 2320

Attention: Jon Mansfield, S Challinor

Sample log in details:

Your Reference:	<u>DL3788 West Schofields</u>		
No. of samples:	19 soils		
Date samples received / completed instructions received	26/05/16	/	26/05/16

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data. Samples were analysed as received from the client. Results relate specifically to the samples as received. Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date: 2/06/16 / 1/06/16
Date of Preliminary Report: Not Issued
NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:


Jacinta Hurst
Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil Our Reference: Your Reference	UNITS ----- -	147388-1 A-TP1	147388-2 A-TP2	147388-3 B-TP1	147388-4 B-TP2	147388-5 C-TP2
Depth	-----	0.5	0.3	0.4	0.3	0.5
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Date analysed	-	27/05/2016	27/05/2016	27/05/2016	27/05/2016	27/05/2016
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	100	98	98	102	98

vTRH(C6-C10)/BTEXN in Soil Our Reference: Your Reference	UNITS ----- -	147388-6 C-TP4	147388-7 D-TP2	147388-8 D-TP4	147388-9 E-TP2	147388-10 E-TP4
Depth	-----	1.0	0.4	0.2	0.3	0.2
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Date analysed	-	27/05/2016	27/05/2016	27/05/2016	27/05/2016	27/05/2016
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	93	99	100	99	99

Client Reference: DL3788 West Schofields

vTRH(C6-C10)/BTEXN in Soil Our Reference: Your Reference	UNITS ----- -	147388-11 F-TP1	147388-12 F-TP2	147388-13 G-TP1	147388-14 G-TP1A	147388-15 G-TP3
Depth	-----	0.2	03	0.2	0.2	0.2
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Date analysed	-	27/05/2016	27/05/2016	27/05/2016	27/05/2016	27/05/2016
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	97	99	96	99	99

vTRH(C6-C10)/BTEXN in Soil Our Reference: Your Reference	UNITS ----- -	147388-16 G-TP3A
Depth	-----	0.2
Date Sampled		24/05/2016
Type of sample		soil
Date extracted	-	26/05/2016
Date analysed	-	27/05/2016
TRHC ₆ - C ₉	mg/kg	<25
TRHC ₆ - C ₁₀	mg/kg	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	100

Client Reference: DL3788 West Schofields

svTRH (C10-C40) in Soil Our Reference: Your Reference	UNITS ----- -	147388-1 A-TP1	147388-2 A-TP2	147388-3 B-TP1	147388-4 B-TP2	147388-5 C-TP2
Depth	-----	0.5	0.3	0.4	0.3	0.5
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Date analysed	-	29/05/2016	29/05/2016	29/05/2016	29/05/2016	29/05/2016
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	79	80	81	78	81

svTRH (C10-C40) in Soil Our Reference: Your Reference	UNITS ----- -	147388-6 C-TP4	147388-7 D-TP2	147388-8 D-TP4	147388-9 E-TP2	147388-10 E-TP4
Depth	-----	1.0	0.4	0.2	0.3	0.2
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Date analysed	-	29/05/2016	29/05/2016	29/05/2016	29/05/2016	29/05/2016
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	100	<100	<100	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	79	107	82	79	80

Client Reference: DL3788 West Schofields

svTRH (C10-C40) in Soil Our Reference: Your Reference	UNITS ----- -	147388-11 F-TP1	147388-12 F-TP2	147388-13 G-TP1	147388-14 G-TP1A	147388-15 G-TP3
Depth	-----	0.2	03	0.2	0.2	0.2
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Date analysed	-	29/05/2016	29/05/2016	29/05/2016	29/05/2016	29/05/2016
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	160	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	420	<100	<100	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	480	<100	<100	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	230	<100	<100	<100
Surrogate o-Terphenyl	%	83	85	83	83	87

svTRH (C10-C40) in Soil Our Reference: Your Reference	UNITS ----- -	147388-16 G-TP3A
Depth	-----	0.2
Date Sampled		24/05/2016
Type of sample		soil
Date extracted	-	26/05/2016
Date analysed	-	29/05/2016
TRHC ₁₀ - C ₁₄	mg/kg	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100
Surrogate o-Terphenyl	%	86

Client Reference: DL3788 West Schofields

PAHs in Soil Our Reference: Your Reference	UNITS ----- -	147388-1 A-TP1	147388-2 A-TP2	147388-3 B-TP1	147388-4 B-TP2	147388-5 C-TP2
Depth	-----	0.5	0.3	0.4	0.3	0.5
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Date analysed	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	106	104	105	107	112

Client Reference: DL3788 West Schofields

PAHs in Soil Our Reference: Your Reference	UNITS ----- -	147388-6 C-TP4	147388-7 D-TP2	147388-8 D-TP4	147388-9 E-TP2	147388-10 E-TP4
Depth	-----	1.0	0.4	0.2	0.3	0.2
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Date analysed	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.3	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	0.5	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	0.3	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	0.3	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	0.7	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.52	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.4	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.5	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	0.7	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	0.7	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	0.8	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE	3.7	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	101	115	112	112	110

Client Reference: DL3788 West Schofields

PAHs in Soil Our Reference: Your Reference	UNITS ----- -	147388-11 F-TP1	147388-12 F-TP2	147388-13 G-TP1	147388-14 G-TP1A	147388-15 G-TP3
Depth	-----	0.2	03	0.2	0.2	0.2
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Date analysed	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	0.1	0.2
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	0.1	0.6	0.6
Pyrene	mg/kg	<0.1	<0.1	0.2	0.7	0.6
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	0.3	0.3
Chrysene	mg/kg	<0.1	<0.1	<0.1	0.3	0.2
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	0.3	0.6	0.5
Benzo(a)pyrene	mg/kg	<0.05	<0.05	0.2	0.4	0.3
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	0.1	0.2	0.2
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	0.2	0.3	0.3
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	0.6	0.5
Total Positive PAHs	mg/kg	NIL(+)/VE	NIL(+)/VE	1.1	3.5	3.3
Surrogate p-Terphenyl-d14	%	111	113	117	119	116

PAHs in Soil Our Reference: Your Reference	UNITS ----- -	147388-16 G-TP3A	147388-17 G-TP3- BITUMEN
Depth	-----	0.2	-
Date Sampled		24/05/2016	24/05/2016
Type of sample		soil	soil
Date extracted	-	26/05/2016	26/05/2016
Date analysed	-	26/05/2016	26/05/2016
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	0.5	<0.1
Pyrene	mg/kg	0.5	<0.1
Benzo(a)anthracene	mg/kg	0.2	<0.1
Chrysene	mg/kg	0.2	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.5	<0.2
Benzo(a)pyrene	mg/kg	0.3	0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.2	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.2	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	0.5	<0.5
Total Positive PAHs	mg/kg	2.8	0.05
Surrogate <i>p</i> -Terphenyl-d14	%	118	117

Organochlorine Pesticides in soil	UNITS	147388-1	147388-2	147388-3	147388-4	147388-7
Our Reference:	-----	A-TP1	A-TP2	B-TP1	B-TP2	D-TP2
Your Reference:	-					
Depth	-----	0.5	0.3	0.4	0.3	0.4
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Date analysed	-	28/05/2016	28/05/2016	28/05/2016	28/05/2016	28/05/2016
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	84	84	86	88	86

Client Reference: DL3788 West Schofields

Organochlorine Pesticides in soil	UNITS	147388-8	147388-9	147388-10	147388-11	147388-12
Our Reference:	-----	D-TP4	E-TP2	E-TP4	F-TP1	F-TP2
Your Reference:	-					
Depth	-----	0.2	0.3	0.2	0.2	0.3
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Date analysed	-	28/05/2016	28/05/2016	28/05/2016	28/05/2016	28/05/2016
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	86	86	82	86	88

Client Reference: DL3788 West Schofields

Organophosphorus Pesticides	UNITS	147388-1	147388-2	147388-3	147388-4	147388-7
Our Reference:	-----	A-TP1	A-TP2	B-TP1	B-TP2	D-TP2
Your Reference	-					
Depth	-----	0.5	0.3	0.4	0.3	0.4
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Date analysed	-	28/05/2016	28/05/2016	28/05/2016	28/05/2016	28/05/2016
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	84	84	86	88	86

Organophosphorus Pesticides	UNITS	147388-8	147388-9	147388-10	147388-11	147388-12
Our Reference:	-----	D-TP4	E-TP2	E-TP4	F-TP1	F-TP2
Your Reference	-					
Depth	-----	0.2	0.3	0.2	0.2	0.3
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Date analysed	-	28/05/2016	28/05/2016	28/05/2016	28/05/2016	28/05/2016
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	86	86	82	86	88

Client Reference: DL3788 West Schofields

PCBs in Soil Our Reference: Your Reference	UNITS ----- -	147388-1 A-TP1	147388-2 A-TP2	147388-3 B-TP1	147388-4 B-TP2	147388-7 D-TP2
Depth	-----	0.5	0.3	0.4	0.3	0.4
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Date analysed	-	28/05/2016	28/05/2016	28/05/2016	28/05/2016	28/05/2016
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	84	84	86	88	86

PCBs in Soil Our Reference: Your Reference	UNITS ----- -	147388-8 D-TP4	147388-9 E-TP2	147388-10 E-TP4	147388-11 F-TP1	147388-12 F-TP2
Depth	-----	0.2	0.3	0.2	0.2	0.3
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Date analysed	-	28/05/2016	28/05/2016	28/05/2016	28/05/2016	28/05/2016
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	86	86	82	86	88

Client Reference: DL3788 West Schofields

Acid Extractable metals in soil Our Reference: Your Reference	UNITS ----- -	147388-1 A-TP1	147388-2 A-TP2	147388-3 B-TP1	147388-4 B-TP2	147388-5 C-TP2
Depth	-----	0.5	0.3	0.4	0.3	0.5
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Date analysed	-	27/05/2016	27/05/2016	27/05/2016	27/05/2016	27/05/2016
Arsenic	mg/kg	<4	<4	<4	5	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	8	8	11	11	20
Copper	mg/kg	6	4	10	17	8
Lead	mg/kg	13	10	13	16	15
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	3	5	9	3
Zinc	mg/kg	19	6	9	13	8

Acid Extractable metals in soil Our Reference: Your Reference	UNITS ----- -	147388-6 C-TP4	147388-7 D-TP2	147388-8 D-TP4	147388-9 E-TP2	147388-10 E-TP4
Depth	-----	1.0	0.4	0.2	0.3	0.2
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Date analysed	-	27/05/2016	27/05/2016	27/05/2016	27/05/2016	27/05/2016
Arsenic	mg/kg	4	6	5	13	7
Cadmium	mg/kg	<0.4	<0.4	<0.4	1	<0.4
Chromium	mg/kg	16	18	13	31	15
Copper	mg/kg	13	15	10	27	19
Lead	mg/kg	13	54	24	44	22
Mercury	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	9	5	8	6
Zinc	mg/kg	10	52	28	150	98

Client Reference: DL3788 West Schofields

Acid Extractable metals in soil	UNITS	147388-11	147388-12	147388-13	147388-14	147388-15
Our Reference:	-----	F-TP1	F-TP2	G-TP1	G-TP1A	G-TP3
Your Reference	-					
Depth	-----	0.2	03	0.2	0.2	0.2
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Date analysed	-	27/05/2016	27/05/2016	27/05/2016	27/05/2016	27/05/2016
Arsenic	mg/kg	10	10	6	6	6
Cadmium	mg/kg	0.5	2	<0.4	<0.4	<0.4
Chromium	mg/kg	25	23	19	23	18
Copper	mg/kg	16	39	10	8	31
Lead	mg/kg	29	120	19	18	24
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	10	6	6	13
Zinc	mg/kg	64	220	34	23	140

Acid Extractable metals in soil	UNITS	147388-16
Our Reference:	-----	G-TP3A
Your Reference	-	
Depth	-----	0.2
Date Sampled		24/05/2016
Type of sample		soil
Date prepared	-	26/05/2016
Date analysed	-	27/05/2016
Arsenic	mg/kg	7
Cadmium	mg/kg	<0.4
Chromium	mg/kg	21
Copper	mg/kg	34
Lead	mg/kg	24
Mercury	mg/kg	<0.1
Nickel	mg/kg	13
Zinc	mg/kg	140

Client Reference: DL3788 West Schofields

Misc Inorg - Soil Our Reference: Your Reference	UNITS ----- -	147388-1 A-TP1	147388-2 A-TP2	147388-3 B-TP1	147388-4 B-TP2	147388-5 C-TP2
Depth	-----	0.5	0.3	0.4	0.3	0.5
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	30/05/2016	30/05/2016	30/05/2016	30/05/2016	30/05/2016
Date analysed	-	30/05/2016	30/05/2016	30/05/2016	30/05/2016	30/05/2016
pH 1:5 soil:water	pH Units	6.8	6.0	8.2	7.8	5.3
Electrical Conductivity 1:5 soil:water	µS/cm	150	490	280	440	84
Chloride, Cl 1:5 soil:water	mg/kg	160	760	290	650	<10
Sulphate, SO4 1:5 soil:water	mg/kg	20	20	100	72	110
Estimated Salinity*	mg/kg	520	1,700	960	1,500	280

Misc Inorg - Soil Our Reference: Your Reference	UNITS ----- -	147388-6 C-TP4	147388-7 D-TP2	147388-8 D-TP4	147388-9 E-TP2	147388-10 E-TP4
Depth	-----	1.0	0.4	0.2	0.3	0.2
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	30/05/2016	30/05/2016	30/05/2016	30/05/2016	30/05/2016
Date analysed	-	30/05/2016	30/05/2016	30/05/2016	30/05/2016	30/05/2016
pH 1:5 soil:water	pH Units	6.8	6.5	6.2	8.3	7.1
Electrical Conductivity 1:5 soil:water	µS/cm	92	180	100	220	310
Chloride, Cl 1:5 soil:water	mg/kg	45	53	21	75	23
Sulphate, SO4 1:5 soil:water	mg/kg	61	52	20	38	70
Estimated Salinity*	mg/kg	310	620	340	740	1,000

Misc Inorg - Soil Our Reference: Your Reference	UNITS ----- -	147388-11 F-TP1	147388-12 F-TP2	147388-13 G-TP1	147388-15 G-TP3
Depth	-----	0.2	0.3	0.2	0.2
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil
Date prepared	-	30/05/2016	30/05/2016	30/05/2016	30/05/2016
Date analysed	-	30/05/2016	30/05/2016	30/05/2016	30/05/2016
pH 1:5 soil:water	pH Units	5.6	6.4	6.4	7.1
Electrical Conductivity 1:5 soil:water	µS/cm	78	110	160	320
Chloride, Cl 1:5 soil:water	mg/kg	10	20	37	140
Sulphate, SO4 1:5 soil:water	mg/kg	54	29	77	160
Estimated Salinity*	mg/kg	260	390	540	1,100

Client Reference: DL3788 West Schofields

Moisture Our Reference: Your Reference	UNITS ----- -	147388-1 A-TP1	147388-2 A-TP2	147388-3 B-TP1	147388-4 B-TP2	147388-5 C-TP2
Depth Date Sampled Type of sample	----- ----- -----	0.5 24/05/2016 soil	0.3 24/05/2016 soil	0.4 24/05/2016 soil	0.3 24/05/2016 soil	0.5 24/05/2016 soil
Date prepared	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Date analysed	-	27/05/2016	27/05/2016	27/05/2016	27/05/2016	27/05/2016
Moisture	%	8.9	9.0	10	13	18

Moisture Our Reference: Your Reference	UNITS ----- -	147388-6 C-TP4	147388-7 D-TP2	147388-8 D-TP4	147388-9 E-TP2	147388-10 E-TP4
Depth Date Sampled Type of sample	----- ----- -----	1.0 24/05/2016 soil	0.4 24/05/2016 soil	0.2 24/05/2016 soil	0.3 24/05/2016 soil	0.2 24/05/2016 soil
Date prepared	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Date analysed	-	27/05/2016	27/05/2016	27/05/2016	27/05/2016	27/05/2016
Moisture	%	19	8.4	8.7	20	12

Moisture Our Reference: Your Reference	UNITS ----- -	147388-11 F-TP1	147388-12 F-TP2	147388-13 G-TP1	147388-14 G-TP1A	147388-15 G-TP3
Depth Date Sampled Type of sample	----- ----- -----	0.2 24/05/2016 soil	03 24/05/2016 soil	0.2 24/05/2016 soil	0.2 24/05/2016 soil	0.2 24/05/2016 soil
Date prepared	-	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
Date analysed	-	27/05/2016	27/05/2016	27/05/2016	27/05/2016	27/05/2016
Moisture	%	12	10	6.0	8.0	5.1

Moisture Our Reference: Your Reference	UNITS ----- -	147388-16 G-TP3A	147388-17 G-TP3- BITUMEN
Depth Date Sampled Type of sample	----- ----- -----	0.2 24/05/2016 soil	- 24/05/2016 soil
Date prepared	-	26/05/2016	26/05/2016
Date analysed	-	27/05/2016	27/05/2016
Moisture	%	5.2	0.9

MethodID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'TEQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'TEQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'TEQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore " Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25oC in accordance with APHA latest edition 2510 and Rayment & Lyons.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Inorg-034	Soil samples are extracted and measured using a conductivity cell and dedicated meter.
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.

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QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXN in Soil						Base II Duplicate II %RPD		
Date extracted	-			26/05/2016	147388-1	26/05/2016 26/05/2016	LCS-8	26/05/2016
Date analysed	-			27/05/2016	147388-1	27/05/2016 27/05/2016	LCS-8	27/05/2016
TRHC ₆ - C ₉	mg/kg	25	Org-016	<25	147388-1	<25 <25	LCS-8	108%
TRHC ₆ - C ₁₀	mg/kg	25	Org-016	<25	147388-1	<25 <25	LCS-8	108%
Benzene	mg/kg	0.2	Org-016	<0.2	147388-1	<0.2 <0.2	LCS-8	97%
Toluene	mg/kg	0.5	Org-016	<0.5	147388-1	<0.5 <0.5	LCS-8	103%
Ethylbenzene	mg/kg	1	Org-016	<1	147388-1	<1 <1	LCS-8	111%
m+p-xylene	mg/kg	2	Org-016	<2	147388-1	<2 <2	LCS-8	115%
o-Xylene	mg/kg	1	Org-016	<1	147388-1	<1 <1	LCS-8	110%
naphthalene	mg/kg	1	Org-014	<1	147388-1	<1 <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	102	147388-1	100 98 RPD: 2	LCS-8	104%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH(C10-C40) in Soil						Base II Duplicate II %RPD		
Date extracted	-			26/05/2016	147388-1	26/05/2016 26/05/2016	LCS-8	26/05/2016
Date analysed	-			29/05/2016	147388-1	29/05/2016 29/05/2016	LCS-8	29/05/2016
TRHC ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	147388-1	<50 <50	LCS-8	111%
TRHC ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	147388-1	<100 <100	LCS-8	107%
TRHC ₂₈ - C ₃₆	mg/kg	100	Org-003	<100	147388-1	<100 <100	LCS-8	122%
TRH>C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	147388-1	<50 <50	LCS-8	111%
TRH>C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	147388-1	<100 <100	LCS-8	107%
TRH>C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	147388-1	<100 <100	LCS-8	122%
Surrogate o-Terphenyl	%		Org-003	80	147388-1	79 79 RPD: 0	LCS-8	74%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Date extracted	-			26/05/2016	147388-1	26/05/2016 26/05/2016	LCS-7	26/05/2016
Date analysed	-			26/05/2016	147388-1	26/05/2016 26/05/2016	LCS-7	26/05/2016
Naphthalene	mg/kg	0.1	Org-012	<0.1	147388-1	<0.1 <0.1	LCS-7	104%
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012	<0.1	147388-1	<0.1 <0.1	LCS-7	105%
Phenanthrene	mg/kg	0.1	Org-012	<0.1	147388-1	<0.1 <0.1	LCS-7	111%
Anthracene	mg/kg	0.1	Org-012	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	147388-1	<0.1 <0.1	LCS-7	110%
Pyrene	mg/kg	0.1	Org-012	<0.1	147388-1	<0.1 <0.1	LCS-7	117%
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012	<0.1	147388-1	<0.1 <0.1	LCS-7	84%
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	147388-1	<0.2 <0.2	[NR]	[NR]

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QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	147388-1	<0.05 <0.05	LCS-7	113%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	114	147388-1	106 106 RPD: 0	LCS-7	111%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organochlorine Pesticides in soil						Base II Duplicate II %RPD		
Date extracted	-			26/05/2016	147388-1	26/05/2016 26/05/2016	LCS-7	26/05/2016
Date analysed	-			28/05/2016	147388-1	28/05/2016 28/05/2016	LCS-7	28/05/2016
HCB	mg/kg	0.1	Org-005	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	147388-1	<0.1 <0.1	LCS-7	101%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	147388-1	<0.1 <0.1	LCS-7	99%
Heptachlor	mg/kg	0.1	Org-005	<0.1	147388-1	<0.1 <0.1	LCS-7	91%
delta-BHC	mg/kg	0.1	Org-005	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	147388-1	<0.1 <0.1	LCS-7	104%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	147388-1	<0.1 <0.1	LCS-7	106%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	147388-1	<0.1 <0.1	LCS-7	106%
Dieldrin	mg/kg	0.1	Org-005	<0.1	147388-1	<0.1 <0.1	LCS-7	108%
Endrin	mg/kg	0.1	Org-005	<0.1	147388-1	<0.1 <0.1	LCS-7	115%
pp-DDD	mg/kg	0.1	Org-005	<0.1	147388-1	<0.1 <0.1	LCS-7	102%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	147388-1	<0.1 <0.1	LCS-7	76%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-005	83	147388-1	84 86 RPD: 2	LCS-7	101%

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QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organophosphorus Pesticides						Base II Duplicate II %RPD		
Date extracted	-			26/05/2016	147388-1	26/05/2016 26/05/2016	LCS-7	26/05/2016
Date analysed	-			28/05/2016	147388-1	28/05/2016 28/05/2016	LCS-7	28/05/2016
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
Chlorpyrifos	mg/kg	0.1	Org-008	<0.1	147388-1	<0.1 <0.1	LCS-7	99%
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
Diazinon	mg/kg	0.1	Org-008	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	147388-1	<0.1 <0.1	LCS-7	105%
Dimethoate	mg/kg	0.1	Org-008	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	147388-1	<0.1 <0.1	LCS-7	93%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	147388-1	<0.1 <0.1	LCS-7	91%
Malathion	mg/kg	0.1	Org-008	<0.1	147388-1	<0.1 <0.1	LCS-7	100%
Parathion	mg/kg	0.1	Org-008	<0.1	147388-1	<0.1 <0.1	LCS-7	93%
Ronnel	mg/kg	0.1	Org-008	<0.1	147388-1	<0.1 <0.1	LCS-7	97%
Surrogate TCMX	%		Org-008	83	147388-1	84 86 RPD: 2	LCS-7	85%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PCBs in Soil						Base II Duplicate II %RPD		
Date extracted	-			26/05/2016	147388-1	26/05/2016 26/05/2016	LCS-7	26/05/2016
Date analysed	-			28/05/2016	147388-1	28/05/2016 28/05/2016	LCS-7	28/05/2016
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	147388-1	<0.1 <0.1	LCS-7	111%
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	147388-1	<0.1 <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	83	147388-1	84 86 RPD: 2	LCS-7	85%

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QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base Duplicate %RPD		
Date prepared	-			26/05/2016	147388-1	26/05/2016 26/05/2016	LCS-8	26/05/2016
Date analysed	-			27/05/2016	147388-1	27/05/2016 27/05/2016	LCS-8	27/05/2016
Arsenic	mg/kg	4	Metals-020	<4	147388-1	<4 <4	LCS-8	104%
Cadmium	mg/kg	0.4	Metals-020	<0.4	147388-1	<0.4 <0.4	LCS-8	100%
Chromium	mg/kg	1	Metals-020	<1	147388-1	8 8 RPD: 0	LCS-8	102%
Copper	mg/kg	1	Metals-020	<1	147388-1	6 6 RPD: 0	LCS-8	101%
Lead	mg/kg	1	Metals-020	<1	147388-1	13 12 RPD: 8	LCS-8	97%
Mercury	mg/kg	0.1	Metals-021	<0.1	147388-1	<0.1 <0.1	LCS-8	84%
Nickel	mg/kg	1	Metals-020	<1	147388-1	3 3 RPD: 0	LCS-8	97%
Zinc	mg/kg	1	Metals-020	<1	147388-1	19 17 RPD: 11	LCS-8	99%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Misc Inorg - Soil						Base Duplicate %RPD		
Date prepared	-			30/05/2016	147388-1	30/05/2016 30/05/2016	LCS-1	30/05/2016
Date analysed	-			30/05/2016	147388-1	30/05/2016 30/05/2016	LCS-1	30/05/2016
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	147388-1	6.8 6.8 RPD: 0	LCS-1	101%
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	147388-1	150 180 RPD: 18	LCS-1	96%
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	<10	147388-1	160 210 RPD: 27	LCS-1	97%
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	147388-1	20 25 RPD: 22	LCS-1	107%
Estimated Salinity*	mg/kg	5	Inorg-034	<5	147388-1	520 620 RPD: 18	[NR]	[NR]
QUALITYCONTROL	UNITS	Dup. Sm#		Duplicate		Spike Sm#	Spike % Recovery	
vTRH(C6-C10)/BTEXNin Soil				Base + Duplicate + %RPD				
Date extracted	-	147388-11		26/05/2016 26/05/2016		147388-2	26/05/2016	
Date analysed	-	147388-11		27/05/2016 27/05/2016		147388-2	27/05/2016	
TRHC ₆ - C ₉	mg/kg	147388-11		<25 <25		147388-2	101%	
TRHC ₆ - C ₁₀	mg/kg	147388-11		<25 <25		147388-2	101%	
Benzene	mg/kg	147388-11		<0.2 <0.2		147388-2	90%	
Toluene	mg/kg	147388-11		<0.5 <0.5		147388-2	97%	
Ethylbenzene	mg/kg	147388-11		<1 <1		147388-2	103%	
m+p-xylene	mg/kg	147388-11		<2 <2		147388-2	107%	
o-Xylene	mg/kg	147388-11		<1 <1		147388-2	104%	
naphthalene	mg/kg	147388-11		<1 <1		[NR]	[NR]	
Surrogate aaa-Trifluorotoluene	%	147388-11		97 100 RPD: 3		147388-2	99%	

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QUALITYCONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	147388-11	26/05/2016 26/05/2016	147388-2	26/05/2016
Date analysed	-	147388-11	29/05/2016 29/05/2016	147388-2	29/05/2016
TRHC ₁₀ - C ₁₄	mg/kg	147388-11	<50 <50	147388-2	114%
TRHC ₁₅ - C ₂₈	mg/kg	147388-11	<100 <100	147388-2	115%
TRHC ₂₈ - C ₃₆	mg/kg	147388-11	<100 <100	147388-2	86%
TRH>C ₁₀ -C ₁₆	mg/kg	147388-11	<50 <50	147388-2	114%
TRH>C ₁₆ -C ₃₄	mg/kg	147388-11	<100 <100	147388-2	115%
TRH>C ₃₄ -C ₄₀	mg/kg	147388-11	<100 <100	147388-2	86%
Surrogate o-Terphenyl	%	147388-11	83 82 RPD: 1	147388-2	80%
QUALITYCONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	147388-11	26/05/2016 26/05/2016	147388-2	26/05/2016
Date analysed	-	147388-11	26/05/2016 26/05/2016	147388-2	26/05/2016
Naphthalene	mg/kg	147388-11	<0.1 <0.1	147388-2	99%
Acenaphthylene	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
Acenaphthene	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
Fluorene	mg/kg	147388-11	<0.1 <0.1	147388-2	100%
Phenanthrene	mg/kg	147388-11	<0.1 <0.1	147388-2	107%
Anthracene	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
Fluoranthene	mg/kg	147388-11	<0.1 <0.1	147388-2	108%
Pyrene	mg/kg	147388-11	<0.1 <0.1	147388-2	114%
Benzo(a)anthracene	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
Chrysene	mg/kg	147388-11	<0.1 <0.1	147388-2	82%
Benzo(b,j+k)fluoranthene	mg/kg	147388-11	<0.2 <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	147388-11	<0.05 <0.05	147388-2	108%
Indeno(1,2,3-c,d)pyrene	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	147388-11	111 113 RPD: 2	147388-2	108%

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QUALITYCONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	147388-11	26/05/2016 26/05/2016	147388-2	26/05/2016
Date analysed	-	147388-11	28/05/2016 28/05/2016	147388-2	28/05/2016
HCB	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
alpha-BHC	mg/kg	147388-11	<0.1 <0.1	147388-2	130%
gamma-BHC	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
beta-BHC	mg/kg	147388-11	<0.1 <0.1	147388-2	121%
Heptachlor	mg/kg	147388-11	<0.1 <0.1	147388-2	129%
delta-BHC	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
Aldrin	mg/kg	147388-11	<0.1 <0.1	147388-2	111%
Heptachlor Epoxide	mg/kg	147388-11	<0.1 <0.1	147388-2	121%
gamma-Chlordane	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
Endosulfan I	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
pp-DDE	mg/kg	147388-11	<0.1 <0.1	147388-2	132%
Dieldrin	mg/kg	147388-11	<0.1 <0.1	147388-2	130%
Endrin	mg/kg	147388-11	<0.1 <0.1	147388-2	137%
pp-DDD	mg/kg	147388-11	<0.1 <0.1	147388-2	132%
Endosulfan II	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
pp-DDT	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	147388-11	<0.1 <0.1	147388-2	129%
Methoxychlor	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
Surrogate TCMX	%	147388-11	86 88 RPD: 2	147388-2	88%

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QUALITYCONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	147388-11	26/05/2016 26/05/2016	147388-2	26/05/2016
Date analysed	-	147388-11	28/05/2016 28/05/2016	147388-2	28/05/2016
Azinphos-methyl (Guthion)	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
Bromophos-ethyl	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	147388-11	<0.1 <0.1	147388-2	89%
Chlorpyriphos-methyl	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
Diazinon	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
Dichlorvos	mg/kg	147388-11	<0.1 <0.1	147388-2	94%
Dimethoate	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
Ethion	mg/kg	147388-11	<0.1 <0.1	147388-2	97%
Fenitrothion	mg/kg	147388-11	<0.1 <0.1	147388-2	83%
Malathion	mg/kg	147388-11	<0.1 <0.1	147388-2	84%
Parathion	mg/kg	147388-11	<0.1 <0.1	147388-2	79%
Ronnel	mg/kg	147388-11	<0.1 <0.1	147388-2	89%
Surrogate TCMX	%	147388-11	86 88 RPD: 2	147388-2	76%
QUALITYCONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	147388-11	26/05/2016 26/05/2016	147388-2	26/05/2016
Date analysed	-	147388-11	28/05/2016 28/05/2016	147388-2	28/05/2016
Aroclor 1016	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
Aroclor 1221	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
Aroclor 1232	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
Aroclor 1242	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
Aroclor 1248	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
Aroclor 1254	mg/kg	147388-11	<0.1 <0.1	147388-2	103%
Aroclor 1260	mg/kg	147388-11	<0.1 <0.1	[NR]	[NR]
Surrogate TCLMX	%	147388-11	86 88 RPD: 2	147388-2	76%
QUALITYCONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	147388-11	26/05/2016 26/05/2016	147388-2	26/05/2016
Date analysed	-	147388-11	27/05/2016 27/05/2016	147388-2	27/05/2016
Arsenic	mg/kg	147388-11	10 10 RPD: 0	147388-2	92%
Cadmium	mg/kg	147388-11	0.5 0.6 RPD: 18	147388-2	98%
Chromium	mg/kg	147388-11	25 23 RPD: 8	147388-2	98%
Copper	mg/kg	147388-11	16 20 RPD: 22	147388-2	101%
Lead	mg/kg	147388-11	29 40 RPD: 32	147388-2	97%
Mercury	mg/kg	147388-11	<0.1 <0.1	147388-2	117%
Nickel	mg/kg	147388-11	6 10 RPD: 50	147388-2	94%
Zinc	mg/kg	147388-11	64 100 RPD: 44	147388-2	94%

Client Reference: DL3788 West Schofields

QUALITYCONTROL Misc Inorg - Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date prepared	-	147388-11	30/05/2016 30/05/2016
Date analysed	-	147388-11	30/05/2016 30/05/2016
pH 1:5 soil:water	pH Units	147388-11	5.6 5.5 RPD: 2
Electrical Conductivity 1:5 soil:water	µS/cm	147388-11	78 72 RPD: 8
Chloride, Cl 1:5 soil:water	mg/kg	147388-11	10 10 RPD: 0
Sulphate, SO ₄ 1:5 soil:water	mg/kg	147388-11	54 50 RPD: 8
Estimated Salinity*	mg/kg	147388-11	260 250 RPD: 4

Report Comments:

Asbestos ID was analysed by Approved Identifier:
Asbestos ID was authorised by Approved Signatory:

Not applicable for this job
Not applicable for this job

INS: Insufficient sample for this test
NR: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike: A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample): This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

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

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

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

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



CERTIFICATE OF ANALYSIS

147388-A

Client:

DLA Environmental Services Pty Ltd (Maitland)
42B Church St
Maitland
NSW 2320

Attention: Jon Mansfield, S Challinor

Sample log in details:

Your Reference:	<u>DL3788 West Schofields</u>	
No. of samples:	19 soils	
Date samples received / completed instructions received	26/05/16	/ 19/07/16

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data. Samples were analysed as received from the client. Results relate specifically to the samples as received. Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date: 20/07/16 / 20/07/16
Date of Preliminary Report: Not Issued
NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

David Springer
General Manager

Texture and Salinity Our Reference: Your Reference	UNITS ----- -	147388-A-1 A-TP1	147388-A-2 A-TP2	147388-A-3 B-TP1	147388-A-4 B-TP2	147388-A-5 C-TP2
Depth	-----	0.5	0.3	0.4	0.3	0.5
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	30/05/2016	30/05/2016	30/05/2016	30/05/2016	30/05/2016
Date analysed	-	20/07/2016	20/07/2016	20/07/2016	20/07/2016	20/07/2016
Electrical Conductivity 1:5 soil:water	µS/cm	150	490	280	440	84
Texture Value	-	9.0	9.0	9.0	8.5	8.0
TEXTURE	-	Clay Loam	Clay Loam	Clay Loam	Light Clay	Light Medium Clay
ECe	dS/m	<2	4	3	4	<2
Class	-	NONSALINE	MODERATELY SALINE	SLIGHTLY SALINE	SLIGHTLY SALINE	NONSALINE

Texture and Salinity Our Reference: Your Reference	UNITS ----- -	147388-A-6 C-TP4	147388-A-7 D-TP2	147388-A-8 D-TP4	147388-A-9 E-TP2	147388-A-10 E-TP4
Depth	-----	1.0	0.4	0.2	0.3	0.2
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	30/05/2016	30/05/2016	30/05/2016	30/05/2016	30/05/2016
Date analysed	-	20/07/2016	20/07/2016	20/07/2016	20/07/2016	20/07/2016
Electrical Conductivity 1:5 soil:water	µS/cm	92	180	100	220	310
Texture Value	-	8.0	10	10	9.0	10
TEXTURE	-	Light Medium Clay	Light Clay	Light Clay	Clay Loam	Loam
ECe	dS/m	<2	2	<2	2	3
Class	-	NONSALINE	NONSALINE	NONSALINE	NONSALINE	SLIGHTLY SALINE

Client Reference: DL3788 West Schofields

Texture and Salinity Our Reference: Your Reference	UNITS ----- -	147388-A-11 F-TP1	147388-A-12 F-TP2	147388-A-13 G-TP1	147388-A-15 G-TP3
Depth	-----	0.2	03	0.2	0.2
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil
Date prepared	-	30/05/2016	30/05/2016	30/05/2016	20/07/2016
Date analysed	-	20/07/2016	20/07/2016	20/07/2016	20/07/2016
Electrical Conductivity 1:5 soil:water	µS/cm	78	110	160	320
Texture Value	-	10	10	10	10
TEXTURE	-	Loam	Loam	Loam	Loam
ECe	dS/m	<2	<2	2	3
Class	-	NONSALINE	NONSALINE	NONSALINE	SLIGHTLY SALINE

Client Reference: DL3788 West Schofields

ESP/CEC						
Our Reference:	UNITS	147388-A-1	147388-A-2	147388-A-3	147388-A-4	147388-A-5
Your Reference	-----	A-TP1	A-TP2	B-TP1	B-TP2	C-TP2
	-					
Depth	-----	0.5	0.3	0.4	0.3	0.5
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	20/07/2016	20/07/2016	20/07/2016	20/07/2016	20/07/2016
Date analysed	-	20/07/2016	20/07/2016	20/07/2016	20/07/2016	20/07/2016
Exchangeable Ca	meq/100g	2.3	1.8	2.9	5.1	0.7
Exchangeable K	meq/100g	<0.1	<0.1	<0.1	0.1	0.2
Exchangeable Mg	meq/100g	0.96	1.4	3.3	5.4	7.9
Exchangeable Na	meq/100g	<0.1	0.14	0.80	1.1	1.3
Cation Exchange Capacity	meq/100g	3.4	3.4	7.0	12	10
ESP	%	[NT]	4	11	9	13

ESP/CEC						
Our Reference:	UNITS	147388-A-6	147388-A-7	147388-A-8	147388-A-9	147388-A-10
Your Reference	-----	C-TP4	D-TP2	D-TP4	E-TP2	E-TP4
	-					
Depth	-----	1.0	0.4	0.2	0.3	0.2
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	20/07/2016	20/07/2016	20/07/2016	20/07/2016	20/07/2016
Date analysed	-	20/07/2016	20/07/2016	20/07/2016	20/07/2016	20/07/2016
Exchangeable Ca	meq/100g	8.1	15	4.3	7.5	9.3
Exchangeable K	meq/100g	0.3	0.3	0.3	3.6	2.3
Exchangeable Mg	meq/100g	9.0	3.6	4.3	4.2	3.8
Exchangeable Na	meq/100g	0.99	0.18	0.14	0.42	<0.1
Cation Exchange Capacity	meq/100g	18	19	9.1	16	15
ESP	%	5	<1	2	3	<1

ESP/CEC					
Our Reference:	UNITS	147388-A-11	147388-A-12	147388-A-13	147388-A-15
Your Reference	-----	F-TP1	F-TP2	G-TP1	G-TP3
	-				
Depth	-----	0.2	0.3	0.2	0.2
Date Sampled		24/05/2016	24/05/2016	24/05/2016	24/05/2016
Type of sample		soil	soil	soil	soil
Date prepared	-	20/07/2016	20/07/2016	20/07/2016	20/07/2016
Date analysed	-	20/07/2016	20/07/2016	20/07/2016	20/07/2016
Exchangeable Ca	meq/100g	7.2	11	5.3	9.3
Exchangeable K	meq/100g	0.5	0.7	0.4	0.4
Exchangeable Mg	meq/100g	5.7	5.2	2.8	2.0
Exchangeable Na	meq/100g	0.13	<0.1	<0.1	<0.1
Cation Exchange Capacity	meq/100g	14	17	8.6	12
ESP	%	<1	<1	[NT]	<1

Method ID	Methodology Summary
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25oC in accordance with APHA latest edition 2510 and Rayment & Lyons.
Metals-009	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.

Client Reference: DL3788 West Schofields

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Texture and Salinity						Base II Duplicate II %RPD		
Date prepared	-			30/05/2016	[NT]	[NT]	LCS-1	30/05/2016
Date analysed	-			20/07/2016	[NT]	[NT]	LCS-1	20/07/2016
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	[NT]	[NT]	LCS-1	101%
Texture Value Class	-		Inorg-002	[NT]	[NT]	[NT]	[NR]	[NR]
	-			[NT]	[NT]	[NT]	[NR]	[NR]
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
ESP/CEC						Base II Duplicate II %RPD		
Date prepared	-			20/07/2016	147388-A-1	20/07/2016 20/07/2016	LCS-1	20/07/2016
Date analysed	-			20/07/2016	147388-A-1	20/07/2016 20/07/2016	LCS-1	20/07/2016
Exchangeable Ca	meq/100 g	0.1	Metals-009	<0.1	147388-A-1	2.3 2.4 RPD: 4	LCS-1	113%
Exchangeable K	meq/100 g	0.1	Metals-009	<0.1	147388-A-1	<0.1 <0.1	LCS-1	109%
Exchangeable Mg	meq/100 g	0.1	Metals-009	<0.1	147388-A-1	0.96 1.0 RPD: 4	LCS-1	121%
Exchangeable Na	meq/100 g	0.1	Metals-009	<0.1	147388-A-1	<0.1 <0.1	LCS-1	104%
ESP	%	1	Metals-009	<1	[NT]	[NT]	[NR]	[NR]
QUALITYCONTROL	UNITS	Dup. Sm#		Duplicate Base + Duplicate + %RPD				
ESP/CEC								
Date prepared	-	147388-A-11		20/07/2016 20/07/2016				
Date analysed	-	147388-A-11		20/07/2016 20/07/2016				
Exchangeable Ca	meq/100 g	147388-A-11		7.2 7.3 RPD: 1				
Exchangeable K	meq/100 g	147388-A-11		0.5 0.5 RPD: 0				
Exchangeable Mg	meq/100 g	147388-A-11		5.7 5.8 RPD: 2				
Exchangeable Na	meq/100 g	147388-A-11		0.13 0.12 RPD: 8				
ESP	%	147388-A-11		<1 <1				

Report Comments:

ESP: Where the exchangeable Sodium is less than the PQL and CEC is less than 10meq/100g, the ESP cannot be calculated.

Texture/Salinity Classification is non NATA

Asbestos ID was analysed by Approved Identifier: Not applicable for this job

Asbestos ID was authorised by Approved Signatory: Not applicable for this job

INS: Insufficient sample for this test

PQL: Practical Quantitation Limit

NT: Not tested

NR: Test not required

RPD: Relative Percent Difference

NA: Test not required

<: Less than

>: Greater than

LCS: Laboratory Control Sample

Quality Control Definitions

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Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike: A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample): This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

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

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



CERTIFICATE OF ANALYSIS

149577

Client:

DLA Environmental Services Pty Ltd
Unit 3, 38 Leighton Pl
Hornsby
NSW 2077

Attention: John Mansfield

Sample log in details:

Your Reference:	<u>DL3788, West Schofields Precinct</u>
No. of samples:	6 Soils
Date samples received / completed instructions received	05/07/16 / 05/07/16

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data. Samples were analysed as received from the client. Results relate specifically to the samples as received. Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date: 12/07/16 / 8/07/16
Date of Preliminary Report: Not Issued
NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

David Springer
General Manager

vTRH(C6-C10)/BTEXN in Soil Our Reference: Your Reference	UNITS ----- -	149577-1 1m - 31 south	149577-2 0.5 - 31 south	149577-3 1.5 - 4 Durham	149577-4 0.5 - 4 Durham	149577-5 0.5 - 46 Durham
Depth	-----	1m	0.5m	1.5m	0.5m	0.5m
Date Sampled		1/07/2016	1/07/2016	1/07/2016	1/07/2016	1/07/2016
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/07/2016	06/07/2016	06/07/2016	06/07/2016	06/07/2016
Date analysed	-	07/07/2016	07/07/2016	07/07/2016	07/07/2016	07/07/2016
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	87	92	105	93	93

vTRH(C6-C10)/BTEXN in Soil Our Reference: Your Reference	UNITS ----- -	149577-6 0.2 - 46 Durham
Depth	-----	0.2m
Date Sampled		1/07/2016
Type of sample		Soil
Date extracted	-	06/07/2016
Date analysed	-	07/07/2016
TRHC ₆ - C ₉	mg/kg	<25
TRHC ₆ - C ₁₀	mg/kg	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	88

Client Reference: DL3788, West Schofields Precinct

svTRH (C10-C40) in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- - -----	149577-1 1m - 31 south 1m 1/07/2016 Soil	149577-2 0.5 - 31 south 0.5m 1/07/2016 Soil	149577-3 1.5 - 4 Durham 1.5m 1/07/2016 Soil	149577-4 0.5 - 4 Durham 0.5m 1/07/2016 Soil	149577-5 0.5 - 46 Durham 0.5m 1/07/2016 Soil
Date extracted	-	06/07/2016	06/07/2016	06/07/2016	06/07/2016	06/07/2016
Date analysed	-	07/07/2016	07/07/2016	07/07/2016	07/07/2016	07/07/2016
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	92	96	100	73	85

svTRH (C10-C40) in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- - -----	149577-6 0.2 - 46 Durham 0.2m 1/07/2016 Soil
Date extracted	-	06/07/2016
Date analysed	-	07/07/2016
TRHC ₁₀ - C ₁₄	mg/kg	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100
Surrogate o-Terphenyl	%	85

Client Reference: DL3788, West Schofields Precinct

PAHs in Soil Our Reference: Your Reference	UNITS ----- -	149577-1 1m - 31 south	149577-2 0.5 - 31 south	149577-3 1.5 - 4 Durham	149577-4 0.5 - 4 Durham	149577-5 0.5 - 46 Durham
Depth	-----	1m	0.5m	1.5m	0.5m	0.5m
Date Sampled		1/07/2016	1/07/2016	1/07/2016	1/07/2016	1/07/2016
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/07/2016	06/07/2016	06/07/2016	06/07/2016	06/07/2016
Date analysed	-	06/07/2016	06/07/2016	06/07/2016	06/07/2016	06/07/2016
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	NIL(+)/VE	NIL(+)/VE	NIL(+)/VE	NIL(+)/VE	NIL(+)/VE
Surrogate p-Terphenyl-d14	%	104	99	110	111	104

PAHs in Soil		
Our Reference:	UNITS	149577-6
Your Reference	-----	0.2 - 46 Durham
	-	
Depth	-----	0.2m
Date Sampled		1/07/2016
Type of sample		Soil
Date extracted	-	06/07/2016
Date analysed	-	06/07/2016
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE
Surrogate <i>p</i> -Terphenyl-d14	%	106

Organochlorine Pesticides in soil	UNITS	149577-2	149577-4	149577-6
Our Reference:	-----	0.5 - 31 south	0.5 - 4 Durham	0.2 - 46 Durham
Your Reference	-			
Depth	-----	0.5m	0.5m	0.2m
Date Sampled		1/07/2016	1/07/2016	1/07/2016
Type of sample		Soil	Soil	Soil
Date extracted	-	06/07/2016	06/07/2016	06/07/2016
Date analysed	-	07/07/2016	07/07/2016	07/07/2016
HCB	mg/kg	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	92	96	94

Organophosphorus Pesticides	UNITS	149577-2	149577-4	149577-6
Our Reference:	-----	149577-2	149577-4	149577-6
Your Reference	-	0.5 - 31 south	0.5 - 4 Durham	0.2 - 46 Durham
Depth	-----	0.5m	0.5m	0.2m
Date Sampled		1/07/2016	1/07/2016	1/07/2016
Type of sample		Soil	Soil	Soil
Date extracted	-	06/07/2016	06/07/2016	06/07/2016
Date analysed	-	07/07/2016	07/07/2016	07/07/2016
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	92	96	94

PCBs in Soil Our Reference: Your Reference	UNITS ----- -	149577-2 0.5 - 31 south	149577-4 0.5 - 4 Durham	149577-6 0.2 - 46 Durham
Depth	-----	0.5m	0.5m	0.2m
Date Sampled		1/07/2016	1/07/2016	1/07/2016
Type of sample		Soil	Soil	Soil
Date extracted	-	06/07/2016	06/07/2016	06/07/2016
Date analysed	-	07/07/2016	07/07/2016	07/07/2016
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1
Surrogate TCLMX	%	92	96	94

Client Reference: DL3788, West Schofields Precinct

Acid Extractable metals in soil Our Reference: Your Reference	UNITS ----- -	149577-1 1m - 31 south	149577-2 0.5 - 31 south	149577-3 1.5 - 4 Durham	149577-4 0.5 - 4 Durham	149577-5 0.5 - 46 Durham
Depth	-----	1m	0.5m	1.5m	0.5m	0.5m
Date Sampled		1/07/2016	1/07/2016	1/07/2016	1/07/2016	1/07/2016
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	06/07/2016	06/07/2016	06/07/2016	06/07/2016	06/07/2016
Date analysed	-	06/07/2016	06/07/2016	06/07/2016	06/07/2016	06/07/2016
Arsenic	mg/kg	<4	6	<4	7	8
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	5	19	5	18	20
Copper	mg/kg	4	6	9	13	24
Lead	mg/kg	3	19	6	12	21
Mercury	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	<1	3	2	2	9
Zinc	mg/kg	3	47	7	31	37

Acid Extractable metals in soil Our Reference: Your Reference	UNITS ----- -	149577-6 0.2 - 46 Durham
Depth	-----	0.2m
Date Sampled		1/07/2016
Type of sample		Soil
Date prepared	-	06/07/2016
Date analysed	-	06/07/2016
Arsenic	mg/kg	6
Cadmium	mg/kg	<0.4
Chromium	mg/kg	14
Copper	mg/kg	18
Lead	mg/kg	21
Mercury	mg/kg	<0.1
Nickel	mg/kg	8
Zinc	mg/kg	38

Client Reference: DL3788, West Schofields Precinct

Moisture Our Reference: Your Reference	UNITS ----- -	149577-1 1m - 31 south	149577-2 0.5 - 31 south	149577-3 1.5 - 4 Durham	149577-4 0.5 - 4 Durham	149577-5 0.5 - 46 Durham
Depth Date Sampled Type of sample	----- ----- -----	1m 1/07/2016 Soil	0.5m 1/07/2016 Soil	1.5m 1/07/2016 Soil	0.5m 1/07/2016 Soil	0.5m 1/07/2016 Soil
Date prepared	-	6/07/2016	6/07/2016	6/07/2016	6/07/2016	6/07/2016
Date analysed	-	7/07/2016	7/07/2016	7/07/2016	7/07/2016	7/07/2016
Moisture	%	14	8.7	15	16	13

Moisture Our Reference: Your Reference	UNITS ----- -	149577-6 0.2 - 46 Durham
Depth Date Sampled Type of sample	----- ----- -----	0.2m 1/07/2016 Soil
Date prepared	-	6/07/2016
Date analysed	-	7/07/2016
Moisture	%	20

Client Reference: DL3788, West Schofields Precinct

Misc Inorg - Soil Our Reference: Your Reference	UNITS ----- -	149577-1 1m - 31 south	149577-2 0.5 - 31 south	149577-3 1.5 - 4 Durham	149577-4 0.5 - 4 Durham	149577-5 0.5 - 46 Durham
Depth Date Sampled Type of sample	----- ----- -----	1m 1/07/2016 Soil	0.5m 1/07/2016 Soil	1.5m 1/07/2016 Soil	0.5m 1/07/2016 Soil	0.5m 1/07/2016 Soil
Date prepared	-	07/07/2016	07/07/2016	07/07/2016	07/07/2016	07/07/2016
Date analysed	-	07/07/2016	07/07/2016	07/07/2016	07/07/2016	07/07/2016
Estimated Salinity*	mg/kg	1,100	1,400	1,900	220	900

Misc Inorg - Soil Our Reference: Your Reference	UNITS ----- -	149577-6 0.2 - 46 Durham
Depth Date Sampled Type of sample	----- ----- -----	0.2m 1/07/2016 Soil
Date prepared	-	07/07/2016
Date analysed	-	07/07/2016
Estimated Salinity*	mg/kg	220

MethodID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'TEQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'TEQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'TEQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore " Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.
Inorg-034	Soil samples are extracted and measured using a conductivity cell and dedicated meter.

Client Reference: DL3788, West Schofields Precinct

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXN in Soil						Base II Duplicate II %RPD		
Date extracted	-			06/07/2016	149577-6	06/07/2016 06/07/2016	LCS-3	06/07/2016
Date analysed	-			07/07/2016	149577-6	07/07/2016 07/07/2016	LCS-3	07/07/2016
TRHC ₆ - C ₉	mg/kg	25	Org-016	<25	149577-6	<25 <25	LCS-3	102%
TRHC ₆ - C ₁₀	mg/kg	25	Org-016	<25	149577-6	<25 <25	LCS-3	102%
Benzene	mg/kg	0.2	Org-016	<0.2	149577-6	<0.2 <0.2	LCS-3	95%
Toluene	mg/kg	0.5	Org-016	<0.5	149577-6	<0.5 <0.5	LCS-3	105%
Ethylbenzene	mg/kg	1	Org-016	<1	149577-6	<1 <1	LCS-3	105%
m+p-xylene	mg/kg	2	Org-016	<2	149577-6	<2 <2	LCS-3	103%
o-Xylene	mg/kg	1	Org-016	<1	149577-6	<1 <1	LCS-3	103%
naphthalene	mg/kg	1	Org-014	<1	149577-6	<1 <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	95	149577-6	88 87 RPD: 1	LCS-3	96%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH(C10-C40) in Soil						Base II Duplicate II %RPD		
Date extracted	-			06/07/2016	149577-6	06/07/2016 06/07/2016	LCS-3	06/07/2016
Date analysed	-			06/07/2016	149577-6	07/07/2016 07/07/2016	LCS-3	06/07/2016
TRHC ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	149577-6	<50 <50	LCS-3	126%
TRHC ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	149577-6	<100 <100	LCS-3	118%
TRHC ₂₈ - C ₃₆	mg/kg	100	Org-003	<100	149577-6	<100 <100	LCS-3	123%
TRH>C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	149577-6	<50 <50	LCS-3	126%
TRH>C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	149577-6	<100 <100	LCS-3	118%
TRH>C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	149577-6	<100 <100	LCS-3	123%
Surrogate o-Terphenyl	%		Org-003	102	149577-6	85 84 RPD: 1	LCS-3	119%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Date extracted	-			06/07/2016	149577-6	06/07/2016 06/07/2016	LCS-3	06/07/2016
Date analysed	-			06/07/2016	149577-6	06/07/2016 06/07/2016	LCS-3	06/07/2016
Naphthalene	mg/kg	0.1	Org-012	<0.1	149577-6	<0.1 <0.1	LCS-3	86%
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012	<0.1	149577-6	<0.1 <0.1	LCS-3	92%
Phenanthrene	mg/kg	0.1	Org-012	<0.1	149577-6	<0.1 <0.1	LCS-3	117%
Anthracene	mg/kg	0.1	Org-012	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	149577-6	<0.1 <0.1	LCS-3	104%
Pyrene	mg/kg	0.1	Org-012	<0.1	149577-6	<0.1 <0.1	LCS-3	97%
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012	<0.1	149577-6	<0.1 <0.1	LCS-3	94%
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	149577-6	<0.2 <0.2	[NR]	[NR]

Client Reference: DL3788, West Schofields Precinct

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	149577-6	<0.05 <0.05	LCS-3	79%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	88	149577-6	106 109 RPD: 3	LCS-3	114%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organochlorine Pesticides in soil						Base II Duplicate II %RPD		
Date extracted	-			06/07/2016	149577-6	06/07/2016 06/07/2016	LCS-3	06/07/2016
Date analysed	-			07/07/2016	149577-6	07/07/2016 07/07/2016	LCS-3	07/07/2016
HCB	mg/kg	0.1	Org-005	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	149577-6	<0.1 <0.1	LCS-3	90%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	149577-6	<0.1 <0.1	LCS-3	102%
Heptachlor	mg/kg	0.1	Org-005	<0.1	149577-6	<0.1 <0.1	LCS-3	89%
delta-BHC	mg/kg	0.1	Org-005	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	149577-6	<0.1 <0.1	LCS-3	99%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	149577-6	<0.1 <0.1	LCS-3	103%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	149577-6	<0.1 <0.1	LCS-3	108%
Dieldrin	mg/kg	0.1	Org-005	<0.1	149577-6	<0.1 <0.1	LCS-3	105%
Endrin	mg/kg	0.1	Org-005	<0.1	149577-6	<0.1 <0.1	LCS-3	110%
pp-DDD	mg/kg	0.1	Org-005	<0.1	149577-6	<0.1 <0.1	LCS-3	97%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	149577-6	<0.1 <0.1	LCS-3	63%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-005	94	149577-6	94 95 RPD: 1	LCS-3	108%

Client Reference: DL3788, West Schofields Precinct

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organophosphorus Pesticides						Base II Duplicate II %RPD		
Date extracted	-			06/07/2016	149577-6	06/07/2016 06/07/2016	LCS-3	06/07/2016
Date analysed	-			07/07/2016	149577-6	07/07/2016 07/07/2016	LCS-3	07/07/2016
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
Chlorpyrifos	mg/kg	0.1	Org-008	<0.1	149577-6	<0.1 <0.1	LCS-3	90%
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
Diazinon	mg/kg	0.1	Org-008	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	149577-6	<0.1 <0.1	LCS-3	100%
Dimethoate	mg/kg	0.1	Org-008	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	149577-6	<0.1 <0.1	LCS-3	102%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	149577-6	<0.1 <0.1	LCS-3	87%
Malathion	mg/kg	0.1	Org-008	<0.1	149577-6	<0.1 <0.1	LCS-3	93%
Parathion	mg/kg	0.1	Org-008	<0.1	149577-6	<0.1 <0.1	LCS-3	97%
Ronnel	mg/kg	0.1	Org-008	<0.1	149577-6	<0.1 <0.1	LCS-3	92%
Surrogate TCMX	%		Org-008	94	149577-6	94 95 RPD: 1	LCS-3	93%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PCBs in Soil						Base II Duplicate II %RPD		
Date extracted	-			06/07/2016	149577-6	06/07/2016 06/07/2016	LCS-3	06/07/2016
Date analysed	-			07/07/2016	149577-6	07/07/2016 07/07/2016	LCS-3	07/07/2016
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	149577-6	<0.1 <0.1	LCS-3	103%
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	149577-6	<0.1 <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	94	149577-6	94 95 RPD: 1	LCS-3	93%

Client Reference: DL3788, West Schofields Precinct

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Date prepared	-			06/07/2016	149577-6	06/07/2016 06/07/2016	LCS-3	06/07/2016
Date analysed	-			06/07/2016	149577-6	06/07/2016 06/07/2016	LCS-3	06/07/2016
Arsenic	mg/kg	4	Metals-020	<4	149577-6	6 6 RPD: 0	LCS-3	111%
Cadmium	mg/kg	0.4	Metals-020	<0.4	149577-6	<0.4 <0.4	LCS-3	107%
Chromium	mg/kg	1	Metals-020	<1	149577-6	14 14 RPD: 0	LCS-3	110%
Copper	mg/kg	1	Metals-020	<1	149577-6	18 17 RPD: 6	LCS-3	110%
Lead	mg/kg	1	Metals-020	<1	149577-6	21 22 RPD: 5	LCS-3	107%
Mercury	mg/kg	0.1	Metals-021	<0.1	149577-6	<0.1 <0.1	LCS-3	95%
Nickel	mg/kg	1	Metals-020	<1	149577-6	8 8 RPD: 0	LCS-3	102%
Zinc	mg/kg	1	Metals-020	<1	149577-6	38 33 RPD: 14	LCS-3	106%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results		
Misc Inorg - Soil						Base II Duplicate II %RPD		
Date prepared	-			07/07/2016	149577-1	07/07/2016 07/07/2016		
Date analysed	-			07/07/2016	149577-1	07/07/2016 07/07/2016		
Estimated Salinity*	mg/kg	5	Inorg-034	<5	149577-1	1100 1100 RPD: 0		

Report Comments:

Asbestos ID was analysed by Approved Identifier: Not applicable for this job
Asbestos ID was authorised by Approved Signatory: Not applicable for this job

INS: Insufficient sample for this test
NR: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike: A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample): This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

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

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

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

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



CERTIFICATE OF ANALYSIS

149577-A

Client:

DLA Environmental Services Pty Ltd (Maitland)
42B Church St
Maitland
NSW 2320

Attention: Jon Mansfield

Sample log in details:

Your Reference:	<u>DL3788, West Schofields Precinct</u>
No. of samples:	6 Soils
Date samples received / completed instructions received	05/07/16 / 19/07/16

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data. Samples were analysed as received from the client. Results relate specifically to the samples as received. Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date: 20/07/16 / 20/07/16
Date of Preliminary Report: Not Issued
NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

David Springer
General Manager

Misc Inorg - Soil						
Our Reference:	UNITS	149577-A-1	149577-A-2	149577-A-3	149577-A-4	149577-A-5
Your Reference	-----	1m - 31 south	0.5 - 31 south	1.5 - 4 Durham	0.5 - 4 Durham	0.5 - 46 Durham
Depth	-					
	-----	1m	0.5m	1.5m	0.5m	0.5m
Date Sampled		1/07/2016	1/07/2016	1/07/2016	1/07/2016	1/07/2016
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/07/2016	20/07/2016	20/07/2016	20/07/2016	20/07/2016
Date analysed	-	20/07/2016	20/07/2016	20/07/2016	20/07/2016	20/07/2016
Chloride, Cl 1:5 soil:water	mg/kg	480	<10	730	370	120
Sulphate, SO4 1:5 soil:water	mg/kg	130	<10	71	290	110

Misc Inorg - Soil		
Our Reference:	UNITS	149577-A-6
Your Reference	-----	0.2 - 46 Durham
Depth	-	
	-----	0.2m
Date Sampled		1/07/2016
Type of sample		Soil
Date prepared	-	20/07/2016
Date analysed	-	20/07/2016
Chloride, Cl 1:5 soil:water	mg/kg	10
Sulphate, SO4 1:5 soil:water	mg/kg	20

Client Reference: DL3788, West Schofields Precinct

ESP/CEC	UNITS	149577-A-1	149577-A-2	149577-A-3	149577-A-4	149577-A-5
Our Reference:	-----	149577-A-1	149577-A-2	149577-A-3	149577-A-4	149577-A-5
Your Reference	-	1m - 31 south	0.5 - 31 south	1.5 - 4 Durham	0.5 - 4 Durham	0.5 - 46 Durham
Depth	-----	1m	0.5m	1.5m	0.5m	0.5m
Date Sampled		1/07/2016	1/07/2016	1/07/2016	1/07/2016	1/07/2016
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/07/2016	20/07/2016	20/07/2016	20/07/2016	20/07/2016
Date analysed	-	20/07/2016	20/07/2016	20/07/2016	20/07/2016	20/07/2016
Exchangeable Ca	meq/100g	0.3	5.1	<0.1	0.3	0.4
Exchangeable K	meq/100g	0.3	0.2	<0.1	0.1	0.1
Exchangeable Mg	meq/100g	7.0	1.4	6.4	3.6	5.6
Exchangeable Na	meq/100g	1.5	<0.1	2.2	1.1	1.5
Cation Exchange Capacity	meq/100g	9.0	6.8	8.7	5.2	7.7
ESP	%	16	[NT]	25	21	20

ESP/CEC	UNITS	149577-A-6
Our Reference:	-----	149577-A-6
Your Reference	-	0.2 - 46 Durham
Depth	-----	0.2m
Date Sampled		1/07/2016
Type of sample		Soil
Date prepared	-	20/07/2016
Date analysed	-	20/07/2016
Exchangeable Ca	meq/100g	3.6
Exchangeable K	meq/100g	0.7
Exchangeable Mg	meq/100g	4.9
Exchangeable Na	meq/100g	0.25
Cation Exchange Capacity	meq/100g	9.4
ESP	%	3

Client Reference: DL3788, West Schofields Precinct

Texture and Salinity Our Reference: Your Reference	UNITS ----- -	149577-A-1 1m - 31 south	149577-A-2 0.5 - 31 south	149577-A-3 1.5 - 4 Durham	149577-A-4 0.5 - 4 Durham	149577-A-5 0.5 - 46 Durham
Depth	-----	1m	0.5m	1.5m	0.5m	0.5m
Date Sampled		1/07/2016	1/07/2016	1/07/2016	1/07/2016	1/07/2016
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	07/07/2016	07/07/2016	07/07/2016	07/07/2016	07/07/2016
Date analysed	-	20/07/2016	20/07/2016	20/07/2016	20/07/2016	20/07/2016
Electrical Conductivity 1:5 soil:water	µS/cm	330	64	560	420	270
Texture Value	-	7.0	10	8.0	7.0	8.5
TEXTURE	-	Medium Clay	Loam	Light Medium Clay	Medium Clay	Light Clay
ECe	dS/m	2	<2	4	3	2
Class	-	SLIGHTLY SALINE	NONSALINE	MODERATELY SALINE	SLIGHTLY SALINE	SLIGHTLY SALINE

Texture and Salinity Our Reference: Your Reference	UNITS ----- -	149577-A-6 0.2 - 46 Durham
Depth	-----	0.2m
Date Sampled		1/07/2016
Type of sample		Soil
Date prepared	-	07/07/2016
Date analysed	-	20/07/2016
Electrical Conductivity 1:5 soil:water	µS/cm	65
Texture Value	-	9.0
TEXTURE	-	Clay Loam
ECe	dS/m	<2
Class	-	NONSALINE

Method ID	Methodology Summary
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Metals-009	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25oC in accordance with APHA latest edition 2510 and Rayment & Lyons.

Client Reference: DL3788, West Schofields Precinct

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Misc Inorg - Soil						Base II Duplicate II %RPD		
Date prepared	-			20/07/2016	[NT]	[NT]	LCS-1	20/07/2016
Date analysed	-			20/07/2016	[NT]	[NT]	LCS-1	20/07/2016
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	<10	[NT]	[NT]	LCS-1	89%
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	[NT]	[NT]	LCS-1	118%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
ESP/CEC						Base II Duplicate II %RPD		
Date prepared	-			20/07/2016	[NT]	[NT]	LCS-1	20/07/2016
Date analysed	-			20/07/2016	[NT]	[NT]	LCS-1	20/07/2016
Exchangeable Ca	meq/100 g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-1	113%
Exchangeable K	meq/100 g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-1	109%
Exchangeable Mg	meq/100 g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-1	121%
Exchangeable Na	meq/100 g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-1	104%
ESP	%	1	Metals-009	<1	[NT]	[NT]	[NR]	[NR]
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Texture and Salinity						Base II Duplicate II %RPD		
Date prepared	-			07/07/2016	149577-A-1	07/07/2016 07/07/2016	LCS-1	07/07/2016
Date analysed	-			20/07/2016	149577-A-1	20/07/2016 20/07/2016	LCS-1	20/07/2016
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	149577-A-1	330 330 RPD: 0	LCS-1	101%
Texture Value	-		Inorg-002	[NT]	149577-A-1	7.0 [N/T]	[NR]	[NR]
Class	-			[NT]	149577-A-1	SLIGHTLY SALINE [N/T]	[NR]	[NR]

Report Comments:

ESP: Where the exchangeable Sodium is less than the PQL and CEC is less than 10meq/100g, the ESP cannot be calculated.

N.B. Texture/Salinity classification is non-NATA.

Asbestos ID was analysed by Approved Identifier: Not applicable for this job
Asbestos ID was authorised by Approved Signatory: Not applicable for this job

INS: Insufficient sample for this test
NR: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

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



CERTIFICATE OF ANALYSIS

150045

Client:

DLA Environmental Services Pty Ltd (Maitland)
42B Church St
Maitland
NSW 2320

Attention: Jon Mansfield

Sample log in details:

Your Reference:	<u>DL3788 Schofields</u>
No. of samples:	3 waters
Date samples received / completed instructions received	13/07/16 / 13/07/16

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data. Samples were analysed as received from the client. Results relate specifically to the samples as received. Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date: 20/07/16 / 20/07/16
Date of Preliminary Report: Not Issued
NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

David Springer
General Manager

vTRH(C6-C10)/BTEXN in Water			
Our Reference:	UNITS	150045-1	150045-3
Your Reference	-----	BH01	BH03
	-		
Date Sampled	-----	12/07/2016	12/07/2016
Type of sample		WATER	WATER
Date extracted	-	14/07/2016	14/07/2016
Date analysed	-	15/07/2016	15/07/2016
TRHC ₆ - C ₉	µg/L	<10	<10
TRHC ₆ - C ₁₀	µg/L	<10	<10
TRHC ₆ - C ₁₀ less BTEX (F1)	µg/L	<10	<10
Benzene	µg/L	<1	<1
Toluene	µg/L	<1	<1
Ethylbenzene	µg/L	<1	<1
m+p-xylene	µg/L	<2	<2
o-xylene	µg/L	<1	<1
Naphthalene	µg/L	<1	<1
Surrogate Dibromofluoromethane	%	102	101
Surrogate toluene-d8	%	98	97
Surrogate 4-BFB	%	105	106

svTRH (C10-C40) in Water			
Our Reference:	UNITS	150045-1	150045-3
Your Reference	-----	BH01	BH03
	-		
Date Sampled	-----	12/07/2016	12/07/2016
Type of sample		WATER	WATER
Date extracted	-	14/07/2016	14/07/2016
Date analysed	-	14/07/2016	14/07/2016
TRHC ₁₀ - C ₁₄	µg/L	<50	<50
TRHC ₁₅ - C ₂₈	µg/L	<100	<100
TRHC ₂₉ - C ₃₆	µg/L	<100	<100
TRH>C ₁₀ - C ₁₆	µg/L	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	<50	<50
TRH>C ₁₆ - C ₃₄	µg/L	<100	<100
TRH>C ₃₄ - C ₄₀	µg/L	<100	<100
Surrogate o-Terphenyl	%	83	87

PAHs in Water Our Reference: Your Reference	UNITS ----- -	150045-1 BH01	150045-3 BH03
Date Sampled	-----	12/07/2016	12/07/2016
Type of sample		WATER	WATER
Date extracted	-	14/07/2016	14/07/2016
Date analysed	-	14/07/2016	14/07/2016
Naphthalene	µg/L	<1	<1
Acenaphthylene	µg/L	<1	<1
Acenaphthene	µg/L	<1	<1
Fluorene	µg/L	<1	<1
Phenanthrene	µg/L	<1	<1
Anthracene	µg/L	<1	<1
Fluoranthene	µg/L	<1	<1
Pyrene	µg/L	<1	<1
Benzo(a)anthracene	µg/L	<1	<1
Chrysene	µg/L	<1	<1
Benzo(b,j+k)fluoranthene	µg/L	<2	<2
Benzo(a)pyrene	µg/L	<1	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1	<1
Dibenzo(a,h)anthracene	µg/L	<1	<1
Benzo(g,h,i)perylene	µg/L	<1	<1
Benzo(a)pyrene TEQ	µg/L	<5	<5
Total +ve PAH's	µg/L	NIL (+)VE	NIL (+)VE
Surrogate <i>p</i> -Terphenyl-d14	%	83	88

HM in water - dissolved				
Our Reference:	UNITS	150045-1	150045-2	150045-3
Your Reference	-----	BH01	BH02	BH03
	-			
Date Sampled	-----	12/07/2016	12/07/2016	12/07/2016
Type of sample		WATER	WATER	WATER
Date prepared	-	15/07/2016	15/07/2016	15/07/2016
Date analysed	-	15/07/2016	15/07/2016	15/07/2016
Arsenic-Dissolved	µg/L	1	<1	<1
Cadmium-Dissolved	µg/L	0.1	0.4	0.3
Chromium-Dissolved	µg/L	<1	<1	<1
Copper-Dissolved	µg/L	1	<1	1
Lead-Dissolved	µg/L	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	18	57	26
Zinc-Dissolved	µg/L	53	41	33

Client Reference: DL3788 Schofields

Miscellaneous Inorganics				
Our Reference:	UNITS	150045-1	150045-2	150045-3
Your Reference	-----	BH01	BH02	BH03
	-			
Date Sampled	-----	12/07/2016	12/07/2016	12/07/2016
Type of sample		WATER	WATER	WATER
Date prepared	-	14/07/2016	14/07/2016	14/07/2016
Date analysed	-	14/07/2016	14/07/2016	14/07/2016
pH	pH Units	6.8	6.4	6.4
Electrical Conductivity	µS/cm	26,000	5,100	18,000

MethodID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Metals-022 ICP-MS	Determination of various metals by ICP-MS.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25oC in accordance with APHA latest edition 2510 and Rayment & Lyons.

Client Reference: DL3788 Schofields

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXN in Water						Base II Duplicate II %RPD		
Date extracted	-			14/07/2016	[NT]	[NT]	LCS-W2	14/07/2016
Date analysed	-			15/07/2016	[NT]	[NT]	LCS-W2	15/07/2016
TRHC ₆ - C ₉	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W2	97%
TRHC ₆ - C ₁₀	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W2	97%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W2	98%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W2	97%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W2	97%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W2	97%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W2	98%
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-016	100	[NT]	[NT]	LCS-W2	99%
Surrogate toluene-d8	%		Org-016	98	[NT]	[NT]	LCS-W2	100%
Surrogate 4-BFB	%		Org-016	104	[NT]	[NT]	LCS-W2	101%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH(C10-C40) in Water						Base II Duplicate II %RPD		
Date extracted	-			14/07/2016	[NT]	[NT]	LCS-W1	14/07/2016
Date analysed	-			14/07/2016	[NT]	[NT]	LCS-W1	14/07/2016
TRHC ₁₀ - C ₁₄	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	117%
TRHC ₁₅ - C ₂₈	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	113%
TRHC ₂₉ - C ₃₆	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	68%
TRH>C ₁₀ - C ₁₆	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	117%
TRH>C ₁₆ - C ₃₄	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	113%
TRH>C ₃₄ - C ₄₀	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	68%
Surrogate o-Terphenyl	%		Org-003	62	[NT]	[NT]	LCS-W1	90%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Water						Base II Duplicate II %RPD		
Date extracted	-			14/07/2016	[NT]	[NT]	LCS-W2	14/07/2016
Date analysed	-			14/07/2016	[NT]	[NT]	LCS-W2	14/07/2016
Naphthalene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-W2	73%
Acenaphthylene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-W2	94%
Phenanthrene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-W2	86%
Anthracene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-W2	79%
Pyrene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-W2	75%
Benzo(a)anthracene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]

Client Reference: DL3788 Schofields

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Water						Base II Duplicate II %RPD		
Chrysene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-W2	85%
Benzo(b,j+k)fluoranthene	µg/L	2	Org-012	<2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-W2	87%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	75	[NT]	[NT]	LCS-W2	80%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
HM in water - dissolved						Base II Duplicate II %RPD		
Date prepared	-			15/07/2016	[NT]	[NT]	LCS-W3	15/07/2016
Date analysed	-			15/07/2016	[NT]	[NT]	LCS-W3	15/07/2016
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W3	86%
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1	[NT]	[NT]	LCS-W3	93%
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W3	81%
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W3	85%
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W3	97%
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	LCS-W3	109%
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W3	89%
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-W3	86%

Client Reference: DL3788 Schofields

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Miscellaneous Inorganics						Base II Duplicate II %RPD		
Date prepared	-			14/07/2016	[NT]	[NT]	LCS-W1	14/07/2016
Date analysed	-			14/07/2016	[NT]	[NT]	LCS-W1	14/07/2016
pH	pH Units		Inorg-001	[NT]	[NT]	[NT]	LCS-W1	101%
Electrical Conductivity	µS/cm	1	Inorg-002	<1	[NT]	[NT]	LCS-W1	103%

Report Comments:

Dissolved Metals: no filtered, preserved sample was received, therefore the unpreserved sample was filtered through 0.45um filter at the lab.

Note: there is a possibility some elements may be underestimated.

Asbestos ID was analysed by Approved Identifier:

Not applicable for this job

Asbestos ID was authorised by Approved Signatory:

Not applicable for this job

INS: Insufficient sample for this test

PQL: Practical Quantitation Limit

NT: Not tested

NR: Test not required

RPD: Relative Percent Difference

NA: Test not required

<: Less than

>: Greater than

LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike: A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample): This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

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

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

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

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

CLIENT DETAILS

LABORATORY DETAILS

Contact Jon Mansfield
 Client DLA ENVIRONMENTAL SERVICES PTY LTD
 Address 42b Church St
 Maitland
 NSW 2320

Telephone 61 2 4933 0001
 Facsimile 61 2 98700999
 Email hunter@dlaenvironmental.com.au

Project **DL3788 West Schofields - Additional**
 Order Number (Not specified)
 Samples 1

Manager Huong Crawford
 Laboratory SGS Alexandria Environmental
 Address Unit 16, 33 Maddox St
 Alexandria NSW 2015

Telephone +61 2 8594 0400
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 Email au.environmental.sydney@sgs.com

SGS Reference **SE152872A R0**
 Date Received 14/7/2016
 Date Reported 15/7/2016

COMMENTS

Accredited for compliance with ISO/IEC 17025. NATA accredited laboratory 2562(4354).

SIGNATORIES



Dong Liang
 Metals/Inorganics Team Leader



Kamrul Ahsan
 Senior Chemist

Total Recoverable Metals in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 14/7/2016

			G-TP1B-0.2
			SOIL
			-
			24/5/2016
			SE152872A.001
PARAMETER	UOM	LOR	
Lead, Pb	mg/kg	1	15
Arsenic, As	mg/kg	1	4
Cadmium, Cd	mg/kg	0.3	0.4
Chromium, Cr	mg/kg	0.5	12
Copper, Cu	mg/kg	0.5	9.8
Nickel, Ni	mg/kg	0.5	5.7
Zinc, Zn	mg/kg	2	31

Mercury in Soil [AN312] Tested: 15/7/2016

			G-TP1B-0.2
			SOIL
			-
			24/5/2016
			SE152872A.001
PARAMETER	UOM	LOR	
Mercury	mg/kg	0.05	<0.05

METHOD

METHODOLOGY SUMMARY

AN040/AN320

A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.

AN312

Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
**	Indicative data, theoretical holding time exceeded.	NVL	Not validated.	LOR	Limit of Reporting.
		IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Samples analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the "Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.

Note that in terms of units of radioactivity:

- a. 1 Bq is equivalent to 27 pCi
- b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : <http://www.sgs.com.au/~media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf>

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Our ref: ASET50610 / 53790 / 1 - 2
Your ref: DL3788 - West Schofields
NATA Accreditation No: 14484



27 May 2016

DLA Environmental Services Pty Ltd
42B Church Street
Maitland NSW 2320

Accredited for compliance with ISO/IEC 17025.

Attn: Mr Stephen Challinor

Dear Stephen

Asbestos Identification

This report presents the results of two samples, forwarded by DLA Environmental Services Pty Ltd on 27 May 2016, for analysis for asbestos.

1. Introduction: Two samples forwarded were examined and analysed for the presence of asbestos.

2. Methods: The samples were examined under a Stereo Microscope and selected fibres were analysed by Polarized Light Microscopy in conjunction with Dispersion Staining method (**Australian Standard AS 4964 - 2004 and Safer Environment Method 1 as the supplementary work instruction**) (**Qualitative Analysis only**).

The report also provides approximate weights and percentages, categories of asbestos forms appearing in the sample, such as **AF** (Asbestos Fines), **FA** (Friable Asbestos) and **ACM** (Asbestos Containing Material), also satisfying the requirements of the WA/ NEPM Guidelines.

3. Results: Sample No. 1. ASET50610 / 53790 / 1. Property E - TP4.

Approx dimensions 10.0 cm x 10.0 cm x 5.0 cm

Approximate total dry weight of soil = 565.0g

The sample consisted of a mixture of clayish soil, stones, plant matter, fragments of plaster and cement.

No asbestos detected.

Sample No. 2. ASET50610 / 53790 / 2. Property E - TP3.

Approx dimensions 10.0 cm x 10.0 cm x 5.2 cm

The sample consisted of a mixture of soil, stones, plant matter, fragments of plaster, cement, fibre cement[^], brick, paint flakes, corroded metal and pieces of glass.

Chrysotile[^] (Estimated approximate weight= 0.03g) asbestos detected.

Estimated approximate total weight of asbestos = 0.03g

Approximate total weight of AF (ACM <7mm) = 0.2g

Approximate total weight of soil = 614.0g

Estimated approximate %w/w = 0.005%

Analysed and reported by,



**Nisansala Maddage. BSc(Hons)
Environmental Scientist/Approved Identifier
Approved Signatory**



Accredited for compliance with ISO/IEC 17025.

This report is consistent with the analytical procedures and reporting recommendations in the Western Australia Guidelines for the Assessment Remediation and Management of Asbestos contaminated sites in Western Australia and it also satisfies the requirements of the current NEPM Guidelines. NATA Accreditation does not cover the performance of this service (NATA ISO/IEC17025 AUG 2014).

Disclaimers;

The approx; weights given above can be used only as a guide. They do not represent absolute weights of each kind of asbestos, as it is impossible to extract all loose fibres from soil and other asbestos containing building material samples using this method. However above figures may be used as closest approximations to the exact values in each case. Estimation and/ or reporting of asbestos fibre weights in asbestos containing materials and soil is out of the Scope of the NATA Accreditation. NATA Accreditation only covers the qualitative part of the results reported. This weight disclaimer also covers weight / weight percentages given.

ACM - Asbestos Containing Material - Products or materials that contain asbestos in an inert bound matrix such as cement or resin. Here taken to be sound material, even as fragments and not fitting through a 7mm X 7 mm sieve.

AF -Includes asbestos free fibres, small fibre bundles and also ACM fragments that pass through a 7mm X 7 mm sieve.

FA -Friable asbestos material such as severely weathered ACM, and asbestos in the form of loose fibrous material such as insulation products.

[^] denotes loose fibres of relevant asbestos types detected in soil/dust and fragments of ACM smaller than 7mm diameter.

*** denotes asbestos detected in ACM in bonded form.**

denotes FA.



The results contained in this report relate only to the sample/s submitted for testing. Australian Safer Environment & Technology accepts no responsibility for whether or not the submitted sample/s is/are representative. Results indicating "No asbestos detected" indicates a reporting limit specified in AS4964 -2004 which is 0.1g/ Kg (0.01%). Any amounts detected at assumed lower level than that would be reported, however those assumed lower levels may be treated as "No asbestos detected" as specified and recommended by AS4964-2004. Trace / respirable level asbestos will be reported only when detected.

Estimation of asbestos weights involves the use of following assumptions;

Volume of each kind of Asbestos present in broken edges have been visually estimated and its been assumed that volumes remain similar throughout the binding matrix and those volumes are only approximate and not exact. Material densities have been assumed to be similar to commonly found similar materials and may not be exact.

All samples indicating "No asbestos detected" are assumed to be less than 0.001 % unless the actual approximate weight is given.



Our ref: ASET50611 / 53791 / 1 - 5
Your ref: DL3788 - West Schofields
NATA Accreditation No: 14484



27 May 2016

DLA Environmental Services Pty Ltd
42B Church Street
Maitland NSW 2320

Accredited for compliance with ISO/IEC 17025.

Attn: Mr Stephen Challinor

Dear Stephen

Asbestos Identification

This report presents the results of five samples, forwarded by DLA Environmental Services Pty Ltd on 27 May 2016, for analysis for asbestos.

1. Introduction: Five samples forwarded were examined and analysed for the presence of asbestos.

2. Methods: The samples were examined under a Stereo Microscope and selected fibres were analysed by Polarized Light Microscopy in conjunction with Dispersion Staining method (Australian Standard AS 4964 - 2004 and Safer Environment Method 1 as the supplementary work instruction) (Qualitative Analysis only).

3. Results: **Sample No. 1. ASET50611 / 53791 / 1. Property E - TP3 - Fragment.**

Approx dimensions 4.0 cm x 2.5 cm x 0.5 cm

The sample consisted of a fragment of a fibre cement material.

Chrysotile asbestos and Amosite asbestos detected.

Sample No. 2. ASET50611 / 53791 / 2. Property E - TP4 - Fragment.

Approx dimensions 6.5 cm x 6.0 cm x 0.5 cm

The sample consisted of a fragment of a fibre cement material.

Chrysotile asbestos and Amosite asbestos detected.

Sample No. 3. ASET50611 / 53791 / 3. Property E - TP1 - Fragment.

Approx dimensions 6.0 cm x 5.0 cm x 0.6 cm

The sample consisted of a fragment of a fibro plaster cement material containing organic fibres.

No asbestos detected.

Sample No. 4. ASET50611 / 53791 / 4. Property F - TP1 - Frag.

Approx dimensions 8.0 cm x 6.0 cm x 0.6 cm

The sample consisted of a fragment of a fibre cement material.

Chrysotile asbestos and Amosite asbestos detected.

The logo for ASET (Australian Safer Environment & Technology) features the letters 'ASET' in a bold, blue, sans-serif font. The letters are set against a yellow background that is shaped like a stylized leaf or a drop, with a white outline.

Sample No. 5. ASET50611 / 53791 / 5. Property F - TP2 - Frag.

Approx dimensions 5.0 cm x 4.0 cm x 0.5 cm

The sample consisted of a fragment of a fibre cement material.

Chrysotile asbestos and Amosite asbestos detected.

Analysed and reported by,

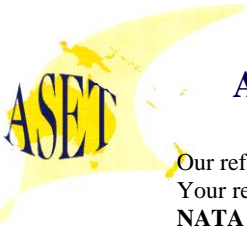
A handwritten signature in black ink, appearing to read 'N. Maddage', is written over a faint, light-colored rectangular stamp or watermark.

Nisansala Maddage. BSc(Hons)
Environmental Scientist/Approved Identifier
Approved Signatory



Accredited for compliance with ISO/IEC 17025.

The results contained in this report relate only to the sample/s submitted for testing. Australian Safer Environment & Technology accepts no responsibility for whether or not the submitted sample/s is/are representative. Results indicating "No asbestos detected" indicates a reporting limit specified in AS4964 -2004 which is 0.1g/ Kg (0.01%). Any amounts detected at assumed lower level than that would be reported, however those assumed lower levels may be treated as "No asbestos detected" as specified and recommended by AS4964-2004. Trace / respirable level asbestos will be reported only when detected.



AUSTRALIAN SAFER ENVIRONMENT & TECHNOLOGY PTY LTD

ABN 36 088 095 112

Our ref: ASET51280 / 54460 / 1 - 2
Your ref: DL3788 - West Schofields Precinct
NATA Accreditation No: 14484

11 July 2016

DLA Environmental Services Pty Ltd
3/38 Leighton Place
Hornsby NSW 2077

Attn: Mr David Lane

Dear David

Asbestos Identification

This report presents the results of two samples, forwarded by DLA Environmental Services Pty Ltd on 8 July 2016, for analysis for asbestos.

1.Introduction:Two samples forwarded were examined and analysed for the presence of asbestos.

2. Methods: The samples were examined under a Stereo Microscope and selected fibres were analysed by Polarized Light Microscopy in conjunction with Dispersion Staining method (**Australian Standard AS 4964 - 2004 and Safer Environment Method 1 as the supplementary work instruction**) (**Qualitative Analysis only**).

The report also provides approximate weights and percentages, categories of asbestos forms appearing in the sample, such as **AF** (Asbestos Fines), **FA** (Friable Asbestos) and **ACM** (Asbestos Containing Material), also satisfying the requirements of the WA/ NEPM Guidelines.

3. Results: **Sample No. 1. ASET51280 / 54460 / 1. 4 Durham Rd ACM.**
Approx dimensions 3.0 cm x 2.0 cm x 0.4 cm
The sample consisted of a fragment of a fibre cement material.
Chrysotile (Estimated approximate weight = 0.22g) asbestos and Amosite (Estimated approximate weight = 0.044g) asbestos detected.
Estimated approximate total weight of asbestos = 0.264g
Approximate total weight of ACM = 2.2g
Estimated approximate %w/w = 12%

Sample No. 2. ASET51280 / 54460 / 2. 4 Durham Rd.
Approx dimensions 10.0 cm x 10.0 cm x 5.0 cm
The sample consisted of a mixture of soil, stones, wood chips, plant matter, fragments of plaster and fibre cement*.
Chrysotile* (Estimated approximate weight = 0.45g) asbestos and Amosite* (Estimated approximate weight = 0.09g) asbestos detected.
Estimated approximate total weight of asbestos = 0.54g
Approximate total weight of ACM (>7mm) = 4.5g
Approximate total dry weight of soil = 173.0g
Estimated approximate %w/w = 0.3%

Analysed and reported by,

Nisansala Maddage. BSc(Hons)
Environmental Scientist/Approved Identifier
Approved Signatory



Accredited for compliance with ISO/IEC 17025.

This report is consistent with the analytical procedures and reporting recommendations in the Western Australia Guidelines for the Assessment Remediation and Management of Asbestos contaminated sites in Western Australia

SUITE 710 / 90 GEORGE STREET, HORNSBY NSW 2077 – P.O. BOX 1644 HORNSBY WESTFIELD NSW 1635
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and it also satisfies the requirements of the current NEPM Guidelines. NATA Accreditation does not cover the performance of this service (NATA ISO/IEC17025 AUG 2014).

Disclaimers;

The approx; weights given above can be used only as a guide. They do not represent absolute weights of each kind of asbestos, as it is impossible to extract all loose fibres from soil and other asbestos containing building material samples using this method. However above figures may be used as closest approximations to the exact values in each case. Estimation and/ or reporting of asbestos fibre weights in asbestos containing materials and soil is out of the Scope of the NATA Accreditation. NATA Accreditation only covers the qualitative part of the results reported. This weight disclaimer also covers weight / weight percentages given.

ACM - Asbestos Containing Material - Products or materials that contain asbestos in an inert bound matrix such as cement or resin. Here taken to be sound material, even as fragments and not fitting through a 7mm X 7 mm sieve.

AF -Includes asbestos free fibres, small fibre bundles and also ACM fragments that pass through a 7mm X 7 mm sieve.

FA -Friable asbestos material such as severely weathered ACM, and asbestos in the form of loose fibrous material such as insulation products.

^ denotes loose fibres of relevant asbestos types detected in soil/dust and fragments of ACM smaller than 7mm diameter.

*** denotes asbestos detected in ACM in bonded form.**

denotes FA.

The results contained in this report relate only to the sample/s submitted for testing. Australian Safer Environment & Technology accepts no responsibility for whether or not the submitted sample/s is/are representative. Results indicating "No asbestos detected" indicates a reporting limit specified in AS4964 -2004 which is 0.1g/ Kg (0.01%). Any amounts detected at assumed lower level than that would be reported, however those assumed lower levels may be treated as "No asbestos detected" as specified and recommended by A4964-2004. Trace / respirable level asbestos will be reported only when detected.

Estimation of asbestos weights involves the use of following assumptions;

Volume of each kind of Asbestos present in broken edges have been visually estimated and its been assumed that volumes remain similar throughout the binding matrix and those volumes are only approximate and not exact. Material densities have been assumed to be similar to commonly found similar materials and may not be exact.

All samples indicating "No asbestos detected" are assumed to be less than 0.001 % unless the actual approximate weight is given.

APPENDIX E – QUALITY ASSURANCE AND QUALITY CONTROL

APPENDIX E1 – FIELD QUALITY CONTROL

During the assessment of contaminated sites, the integrity of data collected is considered paramount. With the assessment of the Site, a number of measures were taken to ensure the quality of the data. These included:

Sample Containers

Soil samples collected during the investigation were placed immediately into laboratory prepared glass jars with Teflon lid inserts. Standard identification labels were adhered to each individual container and labelled according to depth, date, sampling team and media collected.

Decontamination

All equipment used in the sampling program which includes a hand auger, spades and mixing bowl was decontaminated prior to use and between samples to prevent cross contamination. Decontamination of equipment involved the following procedures:

- Cleaning equipment in potable water to remove gross contamination;
- Cleaning in a solution of Decon 90; and,
- Rinsing in clean demineralised water then wiping with clean lint free cloths.

Sample Tracking, Identification and Holding Times

All samples were forwarded to Envirolab Services and SGS Australia under recognised chain of custodies with clear identification outlining the date, location, sampler and sample ID. All samples were recorded by the laboratory as meeting their respective holding times. The sample tracking system is considered adequate for the purposes of sample collection.

Sample Transport

All samples were packed into an esky with ice from the time of collection. These were transported under chain of custody from the site to Envirolab Services Pty Ltd and SGS Australia, NATA registered laboratories located in Chatswood and Alexandria respectively. During the project, the laboratory reported that all the samples arrived intact and were analysed within holding times for the respective analytes. Samples were kept below 4°C at all times. All Trip Spike results were within acceptance criteria providing validation that the transport procedures were satisfactory.

Field Duplicate Samples

Field duplicate samples for soil were prepared in the field through the following process:

- A larger than normal quantity of soil is recovered from the sample location selected for duplication;
- The sample is placed in a decontaminated stainless bowl and mixed as thoroughly as practicable before being divided into equal parts;
- Two portions of the sub-sample are immediately transferred, one for an intra-laboratory duplicate and another as a sample; and,
- Samples are placed into a labelled, laboratory supplied 250ml glass jar and sealed with an airtight, Teflon screw top lid. The fully filled jars are labelled as the sample and duplicate and immediately placed in a chilled esky.

Duplicate samples were prepared on the basis of sample numbers recovered during the field work. The duplicate sample frequency was computed using the total number of samples analysed as part of this assessment. The duplicate sample frequencies are shown below:

SOIL SAMPLES	21 Samples	2 intra-laboratory duplicates	9.5%
		1 inter-laboratory duplicates	4.8%

An intra-laboratory duplicate rate of 9.5% was achieved, less than the 10% required by the Field Quality Plan. An inter-laboratory duplicate rate of 4.8% was achieved, greater than the 5% required by the Field Quality Plan. The QC sampling frequencies were below the nominated rate, however all results of QA/QC procedure indicate compliance with the set criteria.

Comparisons were made of the laboratory test results for the duplicate samples with the original samples and the Relative Percentage Difference (RPD) calculated as difference / average in order to assess the accuracy of the sampling and laboratory test procedures. The comparisons between the duplicates and original samples indicate acceptable RPDs when they comply with criteria which are commonly set at:

- Less than 30% for inorganics and 50% for organics;
- Less than five times the Laboratory LOR; and,
- The difference between concentrations is less than 5% of the relevant HIL concentration.

Table E3 and **Table E4** give details of intra laboratory and inter laboratory chemical duplicates.

Table E3 – Calculated Intra-Laboratory RPDs for Heavy Metal Samples

DUPLICATE	HEAVY METALS							
	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
G-TP1	6	0.2	19	10	19	0.05	6	34
G-TP1A	6	0.2	23	8	18	0.05	6	23
RPD	0%	0%	19%	22%	5%	0%	0%	39%
G-TP3	6	0.2	18	31	24	0.05	13	140
G-TP3A	7	0.2	21	34	24	0.05	13	140
RPD	15%	0%	15%	9%	0%	0%	0%	0%
Criteria RPD%	30	30	30	30	30	30	30	30
LOR	4/3	0.5/0.3	1/0.3	1/0.5	1/1	0.1/0.05	1/0.5	1/0.5

Table E4 – Calculated Inter-Laboratory RPDs for Heavy Metal Samples

DUPLICATE	HEAVY METALS							
	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
G-TP1	6	0.2	19	10	19	0.05	6	34
G-TP1B	4	0.4	12	9.8	15	0.05	5.7	31
RPD	40%	67%	45%	2%	24%	0%	5%	9%
Criteria RPD%	30	30	30	30	30	30	30	30
LOR (Envirolab/SGS)	4/3	0.5/0.3	1/0.3	1/0.5	1/1	0.1/0.05	1/0.5	1/0.5

Field duplicates provide an indication of the whole validation process, including the sampling process, sample preparation and analysis. One intra laboratory duplicate exceeded the DQO of 30% for one heavy metal concentration and one inter laboratory duplicate exceeded the DQO for three heavy metal concentrations.

The difference in concentration of the following intra-laboratory and inter-laboratory duplicate pairs was for reported a concentration of less than 5% of the relevant HIL concentration:

- G-TP1 and GTP1A (for Zn); and,
- G-TP1 and G-TP1B (for As, Cd and Cr).

The remaining differences in concentrations for both intra-laboratory and inter-laboratory duplicate pairs were compliant with the QA/QC criteria.

APPENDIX E2 – LABORATORY ANALYTICAL AND QUALITY PLAN

The integrity of analytical data provides the second step in the QA/QC process for total data compliance. The data validation techniques adopted by DLA are based upon techniques published by the USEPA and in line with methods and guidelines adopted by the NSW EPA and outlined in the NEPM (NEPC, 2013). Descriptions are provided of the specific mechanisms used in the assessment of accuracy, precision and useability of analytical data within the project.

Blanks

Blanks were used for the identification of false positive data. Laboratory blank samples were analysed. No cross contamination of samples is said to have occurred as a result of laboratory techniques provided all blanks show concentrations below the levels of detection. No results on blank samples were above the level of reporting for any determination during the project.

Spikes and Control Samples

Control sample spikes were utilised for determination of matrix recovery analysis. This involves analysis of spiked control samples and their duplicates, spiked with a known concentration of relative analyte. Accuracy was assessed by calculation of the percent recovery (%R). The duplicate sample spikes were used to assess the precision of the methods used. The recoveries for all matrix spike analysis were within the acceptance criteria of 60-140%.

Duplicates

Laboratory Duplicates are tested to ensure the results meet the requirements of QA/QC. The %RPD for the majority of the intra-laboratory and inter-laboratory duplicates had concentrations that complied with the criteria set for acceptable RPDs. Where deviation from the parameters set for RPDs were noted, the effects on the sampling methods and accuracy were not deemed significant.

Surrogates

To assess the performance of individual organic analysis the laboratory used surrogates. Recoveries were calculated for each surrogate providing an indication of analytical accuracy. Surrogate recoveries for soil samples were all within recommended control limits, indicating that there was an acceptable degree of accuracy in analysing for organic compounds.

Laboratory Detection Limits

Laboratory detection limits for soil and water analyses by Envirolab and SGS are outlined in **Table E5** and **Table E6** below:

Table E5 – Method of Soil Analysis: Envirolab

ANALYTE	METHOD	LEVEL OF REPORTING Soil mg/kg			
PAH	USEPA SW-846 Method 8270,	0.1 (Ind. Analyte)			
Metals	USEPA 200.7 USEPA 7471A	Hg	<0.10		
		As-Cd-Cr-Cu	<0.10		
		Ni-Pb-Zn	<0.5		
Pesticides	USEPA SW-846 Method 8081 USEPA SW-846 Method 8140 USEPA SW-846 Method 8080 USEPA SW-846 Method 8870	OCP	0.10		
		OPP	0.10		
		PCB	USEPA SW-846 Method 8080 USEPA SW-846 Method 8081	PCB	0.10
				BTEX	USEPA SW-846 Method 8260
Toluene	1.0				
Ethylbenzene	1.0				
Total Xylene	3.0				
TRH	USEPA SW-846 Method 8260 USEPA SW-846 Method 8000	C6-C9	25		
		C10-C14	50		
		C15-C28	100		
		C29-C36	100		

Table E6 – Method of Soil Analysis: SGS

ANALYTE	METHOD	LEVEL OF REPORTING Soil mg/kg	
PAH	US EPA SW 846 Method 8270C	Ind. Analyte	0.1
	SGS Method ID SEO-030 - In house method.	Benzo[b+k] fluoranthene Benzo(a)Pyrene	0.5 0.05
Metals	SGS Method ID SEM-005 - In house method.	Hg	0.05
	ICP-OES US EPA SW 846 Method 6010B	Ni	0.5
	SGS Method ID SEM-010 - In house method.	Cd-Cr	0.3
		Cu-Zn	0.5
		Pb	2
Pesticides	US EPA SW 846 Method 8081B	OCP	0.1
	SGS Method ID SEO-005 - In house method.	OPP	0.1
PCB	US EPA SW 846 Method 8082A	PCB	0.1
	SGS Method ID SEO-005 - In house method.		
BTEX	US EPA SW 846 Method 8260	Benzene	0.5
	SGS Method ID SEO-017 - In house method.	Toluene	0.5
		Ethylbenzene	0.5
		Total Xylene	1.5
TRH	US EPA SW 846 Method 8260	C6-C9	20
	SGS Method ID SEO-017 - In house method.	C10-C14	20
	US EPA SW 846 Methods 8015B	C15-C28	50
	SGS Method ID SEO-020 - In house method.	C29-C36	50