CONCRETE ESTATES PTY LTD C/- EMKC

APRIL 2021

ENVIRONMENTAL AND GEOTECHNICAL SITE ASSESSMENT

2/65 DUNHEVED CIRCUIT, ST MARY'S NSW 2760

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Environmental and Geotechnical Site Assessment
2/65 Dunheved Circuit, St Mary's NSW 2760

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

ABBREVIATIONS

µg/L	Micrograms per litre
µg/m^3	Micrograms per cubic meter
ANZECC	Australian and New Zealand Environment and Conservation Council
BTEX	Benzene, toluene, ethylbenzene and xylene
BTEXN	Benzene, toluene, ethylbenzene, xylene and naphthalene
CRC CARE	Cooperative Research Council for Contamination Assessment and Remediation of the Environment
GIL	Groundwater investigation level
HSL	Health screening level
LOR	Limit of reporting
m AHD	Metres in Australian Height Datum
m BGL	Metres below ground level
mg/L	Milligrams per litre
mg/m^3	Milligrams per cubic meter
NATA	National Association of Testing Authorities
ND	Not detected above laboratory reporting limits
NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013)
PAHs	Polycyclic aromatic hydrocarbons
ppm	Parts per million
RPD	Relative per cent difference
TRH	Total recoverable hydrocarbon

EXECUTIVE SUMMARY

Concrete Estates Ltd c/o EMKC Pty Ltd (EMKC) commissioned WSP Australia Pty Ltd (WSP) to undertake an environmental and geotechnical site assessment (EGSA) at the property located at 2/65 Dunheved Circuit, St Mary's NSW 2170 ('the site').

OBJECTIVES

The objectives of the ESA were to conduct an intrusive soil and groundwater investigation to provide a general indication of site conditions with respect to likely or possible contamination sources prior to redevelopment, assess the nature and extent of potentially contaminated fill material associated risks to potential on- and off-site receptors, and provide a general indication of geotechnical conditions at the site.

SCOPE OF WORKS

The scope of works for the ESA comprised the excavation and sampling of 15 test pits to a maximum depth of 3 m BGL, visual screening of test pits for asbestos, drilling and geotechnical sampling of 5 boreholes to a maximum depth of 10 m BGL, the conversion of three boreholes to groundwater monitoring wells, groundwater sampling of all wells and preparation of this ESA report in accordance with New South Wales Environment Protection Authority (NSW EPA) *Guidelines for Consultants Reporting on Contaminated Land* (NSW EPA, 2020).

RESULTS

Fill material was identified across the site at depths from 0.2 m BGL in the eastern portion of the site to greater than 3 m BGL in the north-western portion. Concentrations of copper, zinc and nickel that exceed the NEPM (2013) generic ecological investigation criteria were detected within the fill material. No chemical results in soils exceeded health-based criteria for a commercial/industrial land use scenario.

Asbestos was detected in four locations. Following NEPM (2013) quantitative analysis, one location was found to exceeding the health-based criteria for FA and AF but this sample was at a depth of 1.0 m and therefore the actual risk of breathing associated fibers is remote at present. Nevertheless, the presence of asbestos in approximately 20 percent of samples analysed is of concern and warrants additional delineation testing as the sampling density to date has been limited.

The groundwater samples all had elevated copper, nickel and zinc, and two of the three had elevated cadmium. These heavy metals were at concentrations that exceeded ecological thresholds for protection of freshwater ecosystems. These heavy metals, though elevated, are considered likely to be natural in the saline groundwater of the underlying shale.

Light non-aqueous phase liquid (LNAPL) or dense non-aqueous liquid (DNAPL) was not detected in any monitored well. The groundwater was encountered at 6 m BGL and based on the standing water levels, flow direction is inferred to be towards the south, likely discharging to an ephemeral tributary of South Creek, running along the southern boundary of the site.

The Geotechnical Interpretive Report (GIR) did not identify any characteristics that would constrain future development of the proposed warehouse facility, although design measures and ground treatments necessary to accommodate the site conditions will have a cost implication.

The investigation has confirmed that special engineered solutions as discussed in this report will be required to address the reactive clay soils which are prone to movement (shrink and swell) under seasonal changes in moisture content.

Warehouse footings should not be founded in the fill but rather taken down to natural soils or rock. Similarly, unsuitable material shall be removed from hardstand/pavement placement areas to aid in achieving a competent subgrade surface.

OUTCOME

The site has uncharacterized asbestos contamination within the fill profile. WSP recommends that any further intrusive works associated with the development of the site should be undertaken under asbestos controls. WSP suggests that further investigation be undertaken to help characterize the nature and extent of asbestos in the fill profile. This will be used to inform any additional site-specific asbestos controls, the extent of asbestos controls required or eventual remediation.

Considering the assessed status of the site WSP is of the opinion that there is currently no duty to report contamination to the EPA under the *Contaminated Land Management Act 1997*. This should be re-evaluated in light of future asbestos delineation testing.

1 INTRODUCTION

1.1 BACKGROUND

Concrete Estates Ltd c/o EMKC Pty Ltd (EMKC) commissioned WSP Australia Pty Ltd (WSP) to undertake an environmental and geotechnical site assessment at the property located at 2/65 Dunheved Circuit, St Mary's NSW 2170 ('the site'). The site is legally defined as Lot 2 in Deposited Plan (DP) 1175850 and is approximately 2.02 hectares in area.

The site is currently vacant. WSP understands that EMKC's client has acquired the site for the construction of a 5,000 m^2 warehouse.

WSP undertook a contamination and geotechnical preliminary site investigation (PSI) in October 2020 and did not identify any current or recent site uses that would give rise to potentially significant contamination, however a data gap was identified with respect to historical site uses prior to 2009. It was recommended that a more detailed assessment of the site history be undertaken. The PSI also suggested a potential for shallow fill material to be present at the site, but the nature and extent of any fill material could not be quantified without intrusive soil investigations. WSP 2020 recommended that consideration should be given to quantifying the nature and extent of fill in conjunction with any 'pre-development' geotechnical investigations.

The site location and layout plan with the groundwater monitoring well network are presented in Figure 1 and Figure 2 in Appendix A.

1.2 OBJECTIVES

The objectives of the EGSA were:

- To provide a general indication of site soil and groundwater conditions with respect to likely or possible contamination sources prior to redevelopment;
- Assess the nature and extent of fill material;
- To provide a general indication of geotechnical conditions at the site;
- Provide recommendations for geotechnical design parameters, foundation and pavement design and batter and bench construction;
- Assess the risks associated with potential contamination impacts to potential on or off-site receptor; and
- Provide recommendations on the management of site contamination (if any) and geotechnical conditions in relation to the construction of the proposed warehouse.

1.3 SCOPE OF WORKS

The following scope of works was completed:

- Preparation of health, environment and safety plan (HESP), safe work method statements (SWMS), dial before you dig (DBYD) search, internal permitting and contractor engagement (certified service locator and drilling company).
- A desktop review of:
  - the environmental setting (topography, geology, soils, acid sulfate soils, salinity, hydrogeology, regional registered groundwater bores and surrounding land uses); and
  - previous investigations conducted by WSP;

- Fieldwork and laboratory testing that included:
  - A walkover to refine and clear proposed investigation locations from underground services (with an accredited service locator), and inspect the site and surrounds for potential contamination sources;
  - Excavation of 15 test pits by machine excavator to approximately 2-3 m BGL (or 0.5 m into the natural material) to characterise both the shallow and deeper natural soils.
  - Five boreholes were drilled; three drilled to a depth of 8m with continuous flight augers or prior refusal and two advanced by rock coring with HQ3 coring method (to a maximum depth of 10 m BGL). Standard Penetrometer Testing (SPT) were undertaken at 1.0 or 1.5 m intervals to assess soil strength and samples were collected for laboratory testing. Five soil samples were also collected from the geotechnical boreholes for contaminated land purposes.
  - An experienced geotechnical engineer supervised the field investigation and logged each borehole in accordance with AS1726-2017 'Geotechnical Site Investigations'. Observations regarding potential staining, odours or contamination were made to support environmental reporting.
  - Disturbed bulk samples were collected from adjacent CLM test pits for California Bearing Ratio (CBR) testing.
  - Pocket penetrometer (PP) testing was completed on cohesive soil samples recovered from the SPT. Results are shown on the logs at relevant depths.
  - Soil samples submitted to a NATA accredited laboratory for selected contaminants of concern. Scheduled analysis plus necessary duplicates, triplicates and blanks included:
    - Analysis of twenty soil samples for heavy metals, total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene, xylenes, naphthalene (BTEXN) and polycyclic aromatic hydrocarbons (PAHs);
    - fifteen organochlorine and organophosphorus pesticides (OCP/OPP); and
    - fifteen samples for asbestos quantification.
  - Conversion of three of the geotechnical boreholes into groundwater monitoring wells (to a maximum depth of 7 m BGL) using Class 18, 50 mm diameter uPVC, with machine slotted screens, 2 mm sand pack and a bentonite seal. The well annulus, between the bentonite seal and ground, was backfilled with granular bentonite;
  - Development of groundwater monitoring wells;
  - Groundwater gauging for standing water level and potential light non-aqueous phase liquid (LNAPL) across the groundwater network;
  - Measurement of pH, oxidation-reduction potential, electrical conductivity, dissolved oxygen and temperature in the field using a calibrated down hole water quality meter;
  - Collection of three groundwater samples, using Hydrasleeve™ samplers;
    - Analysis of the three groundwater samples by a NATA accredited laboratory for selected contaminants of concern including TRH, BTEXN, PAHs, heavy metals, OCPs and OPPs.
  - Submission of one soil and one water intra-laboratory and inter-laboratory sample for quality assurance/quality control (QA/QC) purposes, at a rate of 1 per 20 samples;
  - One trip blank and spike were transported to the laboratory with both the soil and groundwater samples to assess the potential for cross-contamination of samples during transportation;
- Comparison of soil and groundwater analytical results to adopted health and ecological criteria;
- Development of a conceptual site model (CSM); and

- Preparation of this environmental site assessment report with reference to general expectations for similar reports in the NSW EPA (2020), *Consultants Reporting on Contaminated Land* (NSW EPA, 2020)[1].

[1] This report has been entitled an "environmental site investigation" report as it has been prepared primarily for due diligence purposes and does not comply with sampling densities required for it to be considered a "detailed site investigation". Its objectives are stated in Section 1.2.

2 SITE SETTING

2.1 SITE

Pertinent site details are provided in Table 2.1. The site location is presented in Figure 1, Appendix A.

Table 2.1 Site identification

SITE ADDRESS	2/65 DUNHEVED CIRCUIT, ST MARY'S NSW
Land title	Lot 2 in Deposited Plan (DP) 1175850
Global coordinates	-33.745038343 south; 150.765932134 east (*approximate centre of the site*)
Size	Approximately 2.02 hectares
Local planning instrument	Penrith Local Environmental Plan 2010
Zoning	General Industrial (IN1)
Current site use	Vacant
Proposed land use	Commercial/industrial

The site is predominantly vacant. A site inspection undertaken by WSP on 17 September 2020 during a Phase 1 Environmental Due Diligence (EDD) investigation (WSP, 2020), at that time the north eastern corner was used as a carpark and storage area for the Jaybro storage yard to the north of the site. The site was relatively flat and predominantly covered in grass. The western portion of the site was not vegetated. Shale gravels and large 'boulders' were scattered along the northern portion of the site. Some anthropogenic materials were observed scattered across the site, including plastic pipes, bricks and metal sheeting.

Vegetated drainage channels were observed along the eastern and southern boundaries. The channels were dry at the time of the inspection.

Photographs taken during the field investigation are included in Appendix J.

A summary of the surrounding land use at the site is presented in Table 2.2.

Table 2.2 Summary of surrounding site use

DIRECTION	IMMEDIATE VICINITY (<20 m)	WITHIN 1 km RADIUS
North	Jaybro Geosynthetics storage facility	Commercial/industrial allotments
East	Dunheved Circuit followed by a commercial/industrial premises	Commercial/industrial allotments
South	A gravel road off Links Road, followed by a tributary of South Creek (dry at the time of inspection)	Commercial/industrial allotments
West	Dunheved Golf Course with a tributary of South Creek	South Creek and bushland

2.2 ENVIRONMENTAL SETTING

As per the Phase 1 EDD and Geotechnical Due Diligence conducted by WSP in 2020, the site environmental setting is outlined below.

2.2.1 TOPOGRAPHY

The Site sits an average elevation of approximately 26 m Australian Height Datum (m AHD) (Google Earth, 2020). Regional topography gently slopes to the south and west towards South Creek.

2.2.2 HYDROLOGY

The closest surface water receptor is an ephemeral tributary of South Creek located approximately 60 m from the south western boundary of the Site. The tributary appears to have been modified and has earthen and concrete lining. The tributary travels west before flowing into South Creek, approximately 400 m west of the Site. South Creek eventually meets with the Hawkesbury River, approximately 17 km to the north west of the Site.

2.2.3 GEOLOGY

Based on a review of the *Penrith 1:100,000 Geological Series Sheet 9030 (edition 1) 1991*, the site is underlain by Tertiary and Quaternary period fluvial material and Londonderry Clay. These geological formations are described as follows:

- Qal: Fine-grained sand, silt and clay.
- Ti: Londonderry Clay: Clay, patches of ferruginised, consolidated sand.

The natural subsurface profile, which may be encountered at the Site is as follows:

- Fluvial material including fine-grained silt, sand and clay; overlying
- Londonderry Clay typically comprising moderately to highly plastic clay with sand and iron cemented sandy clay aggregates; overlying
- Rickabys Creek Gravel and Bringelly Shale formations at depth

Based on a review of eSPADE NSW Government soil database, accessed 15 March 2021, the soil landscape of the area encompassing the site consists of the alluvial Berkshire Park Soil Landscape (9030bp).

The Berkshire Park Soil Landscape undulates on Tertiary terraces of the Hawkesbury/Nepean River system. The soils consist of weakly pedal orange heavy clays and clayey sands, often mottled with ironstone nodules being common. Large silcrete boulders may occur in sand/clay matrix.

A review of the Department of Infrastructure, Planning and Natural Resources, *Salinity Potential in Western Sydney 2002* map indicates that the site is situated in an area of high salinity potential which appears to be associated with a localised drainage point into South Creek. This is also reflected in Map 3a of the Land Insight Resources Due Diligence Insight report (2021).

Upon review of the CSIRO's Australian Soil Resource Information System (ASRIS) [accessed 11 September 2020], it is unlikely that acid sulfate soil (ASS) will be encountered at the Site. ASRIS notes, with a confidence level of 4, that there is an "extremely low probability of occurrence".

2.2.4 HYDROGEOLOGY

Review of the Australian Bureau of Meteorology Groundwater Exploration Database [accessed 11 September 2020], indicates that groundwater has previously been encountered in the local area at shallow depth, about 1.5 m BGL. However, based on the majority of monitoring bores reviewed and the location of the Site with respect to major watercourses, it is likely that groundwater would generally be encountered deeper than about 5 m BGL.

Perched water may also be encountered within granular material above cohesive soil layers; more likely directly following periods of heavy rainfall. The regional groundwater aquifer underlying the site is characterised as comprising porous, extensive low to moderate productivity aquifers, based on the *Australia State of the Environment - Inland Waters Principal hydrogeology of Australia (2016)* (accessed on 16 March 2020).

A review of the registered groundwater bore database compiled by the *Australian Government – Bureau of Meteorology, Australian Groundwater explorer* (http://www.bom.gov.au/water/groundwater/explorer/map.shtml) conducted on 15 March 2020 revealed 4 registered groundwater bores within a 500 m radius of the site. All four bores are located at a storage facility approximately 400 m south-west of the site and are recorded as being constructed for monitoring purposes. The current status of the bores is unknown.

A summary of the groundwater bores is presented in Table 2.3.

Table 2.3 Summary of groundwater bores

GROUNDWATER BORE ID	APPROXIMATE LOCATION (m) AND DIRECTION RELATIVE TO THE SITE	PURPOSE	STATUS
GW113135.1.1	380 m south-west	Monitoring	Functional
GW113130.1.1	425 m south-west	Monitoring	Functional
GW113134.1.1	445 m south-west	Monitoring	Functional
GW113127.1.1	490 m south-west	Monitoring	Functional

2.3 HISTORICAL AERIAL PHOTOGRAPHS

Following a data gap identified in publicly available historical imagery, Land Insight Resources (LIR) provided historical photographs from 1947 to 2021 within their Due Diligence Insight Report (Appendix I).

A summary of the aerial photographs is presented in Table 2.4.

Table 2.4 Site historical aerial photographs

YEAR	SITE OBSERVATIONS	SURROUNDING LAND USE
1947	The site is vacant with trees scattered along the north-eastern portion of the site. There is scarring in the ground.	Immediately north of the site are two small sheds. To the north, east and south of the site, low density commercial/industrial warehouses and sheds are present. To the west of the site is an expansive grass area.
1956	Little has changed from the 1947 photograph.	Little has changed to the north, east and south of the site. To the west of the site, the expansive grass area appears to be maintained indicating the Dunheved Golf Course.
1965-1966	The northern portion of the site has either been stripped or had fill material introduced during the construction of the warehouse immediately to the north.	A large warehouse has been constructed immediately to the north of the site. To the north, east and south, there have been more warehouses and shed constructed. To the west, the tributary of South Creek running through the Golf Course appears to have been redirected through a concrete lined channel.

YEAR	SITE OBSERVATIONS	SURROUNDING LAND USE
1970	Little has changed from the 1966 photograph	Little has changed from the 1966 photograph
1975-1978	Little has changed from the 1970 photograph	Little has changed from the 1970 photograph
1980	Little has changed from the 1978 photograph	Increased commercial/industrial building density to the north and east.
1986	Little has changed from the 1980 photograph	Little has changed from the 1980 photograph
1991	Some grey gravel or hardstand is visible along the northern boundary. There is increased vegetation along the eastern boundary.	The warehouse directly to the north of the site has been demolished. Three buildings have replaced it.
1994	Little has changed from the 1991 photograph.	Little has changed from the 1991 photograph.
1998	The site has been completely stripped or levelled with brown/orange material.	The site directly to the north has also been completely stripped and levelled.
2002	Little has changed from the 1998 photograph.	Little has changed from the 1998 photograph.
2005	Little has changed from the 2002 photograph.	Little has changed from the 2002 photograph. Some increased development to the north and east of the site.
2008	The site is vacant with grass covering the western portion of the site and exposed soil on the eastern portion.	Little has changed from the 2005 photograph.
2009	Little has changed from the 2008 photograph.	Little has changed from the 2008 photograph.
2011	The site remains largely unchanged.	The lot directly to the north is used for storage containers.
2019	The site is used as a car storage yard or parking lot. A review of incremental photos throughout 2019 indicates the cars were stored on the Site for a number of months.	The surrounding land use remains largely unchanged.
2021	The site is vacant with a green storage shed on the eastern boundary.	The lot directly to the north is used as an equipment storage yard for Jaybro.

3 PREVIOUS INVESTIGATIONS SUMMARY

3.1 SUMMARY OF ENVIRONMENTAL DUE DILIGENCE

WSP were engaged to identify any potential environmental liabilities at the site, in the context of the proposed acquisition of the site by EMKC's client and the development of a 5,000 m^2 warehouse.

Aerial imagery indicated that the site has remained mostly vacant since 2009, except for the occasional storage / parking of cars for short periods of time (primarily from 2019-2020). No significant current contaminating activities were identified at the site; however, a data gap was identified with respect to historical site uses and a more detailed assessment of the site history was recommended.

At the time of the site inspection, the site was sparsely vegetated along the eastern and southern boundaries and predominantly covered in grass and overgrown weeds. Whilst the site was generally flat there was evidence of potential filling at the site surface, but further intrusive works were recommended to quantify the nature and extent of any shallow fill.

No current or recent site uses have been identified which would give rise to potentially significant contamination, however a data gap was identified with respect to historical site uses prior to 2009. It was suggested to undertake a more detailed assessment of the site history.

The inspection also suggested a potential for shallow fill material to be present at the site, but the nature and extent of any fill material cannot be quantified without intrusive soil investigations. It was recommended that consideration be given to quantifying the nature and extent of fill in conjunction with any 'pre-development' geotechnical investigations.

A review of current and former land uses near the site was undertaken, to identify any potential sources of contamination which could adversely impact the subject site.

A number of surrounding sites (both up-gradient and down-gradient) had either been notified to the NSW EPA as potentially contaminated sites, had records of either former or current notices issued by the NSW EPA or were carrying out activities that were licensed under the POEO Act. The closest licensed site to the subject site is approximately 200 m away.

This finding is not unexpected and is characteristic of "IN1: General Industrial" land zoning. WSP noted that in the event that contaminated groundwater from a nearby site migrates to the subject site, that the polluter and owner of the pollution would be liable for management and clean-up. On this basis, the risk of liability from nearby sites is considered to be low.

The area surrounding South Creek is zoned as "E2: Environmental Conservation" and this should be noted in the context of any future development which has the potential to encroach on the creek alignment. The site is also located within a natural floodplain and flat lying, and the potential risk of flooding should be considered with respect to future earthworks and drainage design. No environmental or heritage planning constraints were identified under the LEP.

3.2 SUMMARY OF GEOTECHNICAL DUE DILIGENCE

In conjunction with the EDD report, WSP were engaged to identify any potential geotechnical constraints at the site, in the context of the proposed acquisition of the site by EMKC's client and the development of a 5,000 m^2 warehouse.

A geotechnical desktop study was conducted to identify any risks or constraints that may potentially impact future development. The geotechnical risks and constraints identified included a potentially shallow groundwater table, a

variable soil and rock profile (which may require variable foundation systems across the site) and a moderately deep clay profile which may be subject to volumetric changes with fluctuation in moisture content.

On the basis of the desktop review, preliminary geotechnical recommendations were provided for site classification, excavation, foundations and pavement design. Intrusive works were recommended, to quantify the geotechnical conditions of the site to enable more detailed risk quantification and the development of specific recommendations to support the proposed warehouse design. Intrusive works at the site would also enable potential liabilities associated with shallow fill material to be further quantified.

4 DATA QUALITY

4.1 DATA QUALITY OBJECTIVES

Systematic planning is critical to successful implementation of an environmental assessment and is used to define the type, quantity and quality of data needed to inform decisions. The United States Environmental Protection Agency (US EPA) has defined a process for establishing Data Quality Objectives (DQOs) (US EPA, 2000a and 2000b); this is referenced in the National Environment Protection Council (NEPC), 2013, *National Environmental Protection (Assessment of Site Contamination) Amendment Measure 2013* (NEPM).

DQOs ensure that:

- The study objectives are set;
- Appropriate types of data are collected (based on contemporary land use and chemicals of concern); and
- The tolerance levels are set for potential decision-making errors.

The DQO process is a seven-step iterative planning approach. The outputs of the DQO process are qualitative and quantitative statements which are developed in the first six steps. They define the purpose of the data collection effort, clarify what the data should represent to satisfy this purpose and specify the performance requirements for the quality of information to be obtained from the data. The output from the first six steps is then used in the seventh step to develop the data collection design that meets all performance criteria and other design requirements and constraints. The seven steps are:

- Step 1: Identify the problem;
- Step 2: Identify the decision;
- Step 3: Identify inputs to the decision;
- Step 4: Define the study boundaries;
- Step 5: Develop a decision rule;
- Step 6: Specify limits on decision errors; and
- Step 7: Optimise the design for obtaining data.

The seven DQO steps for this project are defined in Sections 4.1.1 to 4.1.7.

4.1.1 STEP 1 – STATE THE PROBLEM

The site is planned to be developed from a vacant site to a 5,000 m^2 warehouse. The land use zoning will remain as General Industrial (IN1). An intrusive contamination and geotechnical investigation were undertaken to support the design for the proposed development at the site.

A previous contamination and geotechnical preliminary site investigation conducted by WSP, did not identify current or recent site uses that would give rise to potentially significant contamination, however a data gap was identified with respect to historical site uses prior to 2000. There is potential for shallow fill material to be present at the site, but the nature and extent of fill material needs to be quantified through intrusive soil investigations.

The nature and extent of potential groundwater contamination that may affect the site from off-site sources is unknown. Understanding the risk is pertinent because several nearby sites have either been notified to the NSW EPA, had records of either former or current notices issued by the NSW EPA or were carrying out activities that were licensed under the POEO Act.

4.1.2 STEP 2 – IDENTIFY THE DECISION

The goal of the investigation is to conduct an intrusive soil investigation to quantify the nature and extent of potential shallow fill material and install three wells to characterize the groundwater conditions on site to determine if there are material risks to potential on- and off-site sensitive receptors.

4.1.3 STEP 3 – IDENTIFY INPUTS TO THE DECISION

Inputs required to address the above goals are as follows:

- Information from previous investigations;
- Lithology determined during drilling and test pitting works;
- Water strike depths determined during drilling works and inferred standing water level;
- Concentrations of contaminants if groundwater and soil samples;
- Site assessment criteria for groundwater and soil;
- Observation data including the presence of LNAPL, odours and discolouration; and
- Extent of identified contamination.

4.1.4 STEP 4 – DEFINE THE SITE BOUNDARIES

The boundaries of the investigation have been identified as follows:

- Spatial boundaries as specified in Figure 1, Appendix A;
- Temporal boundaries as determined by the date of the project inception to the completion of the fieldwork under the agreed investigation plan; and
- The potential on- and off-site receptors that need to be considered in the investigation.

4.1.5 STEP 5 – DEVELOP A DECISION RULE

The parameters of interest are final groundwater levels and concentrations of contaminants of concern in groundwater and soil. An assessment of the concentrations of the contaminants of concern is to be undertaken to complete the site investigation and the suitability for continued commercial/industrial land use.

Should concentrations of contaminants of concern exceed the adopted assessment criteria in groundwater or soil and present risk to potential on- or off-site receptors, further risk characterisation may be necessary to delineate the impact and/or assess the risk to identified receptors and inform further management.

4.1.6 STEP 6 – SPECIFY ACCEPTABLE LIMITS ON DECISION ERRORS

In general, a probability that 95% of data will satisfy the data quality indicators (DQIs) is considered acceptable for sample analytical testing, therefore a limit on the decision error will be 5% that a conclusive statement may be incorrect. The potential for significant decision errors are to be minimised by completing a robust QA/QC program and by completing a validation program that has an appropriate sampling and analytical density for the purposes of the assessment and that representative sampling is undertaken.

4.1.7 STEP 7 – OPTIMISE THE DESIGN FOR OBTAINING DATA

Given the project objectives are of a due diligence nature, to provide an indication of the site conditions a sampling density which is approximately half that required for a detailed site investigation was selected, in consultation with the client. Given there were no identified potential point sources for contention in the desktop assessments or the prior site inspection the sampling strategy was to place the selected locations on a loose grid to provide site coverage. The

sampling techniques involved a mix of drill holes to provide depth testing, and test pits to provide for efficiencies in testing the shallow locations and to allow for a good visual appraisal of the soil.

DQIs for completeness, comparability, representativeness, precision and accuracy are also relevant to optimising the design. The DQIs for sampling techniques and laboratory analysis of collected samples identifies the acceptable level of error for the validation are presented in Section 4.2.

4.2 DATA QUALITY INDICATORS

DQIs for field sampling and laboratory analyses of collected delineation samples define the acceptable level of error for this assessment. The data obtained have been assessed as per the following DQIs:

- precision: a quantitative measure of the variability, or reproducibility, of data;
- accuracy: a quantitative measure of the closeness of reported data to the true value;
- representativeness: the confidence that data are representative of each media present on the site;
- comparability: a qualitative parameter expressing the confidence with which one data set can be compared with another; and
- completeness: a measure of the amount of useable data (expressed as %) from a data collection activity.

A summary of the field and laboratory DQIs for the validation assessment are provided in Table 4.1 and Table 4.2.

Table 4.1 DQIs for field techniques

DQI	TECHNIQUE
Precision	WSP standard operating procedures (SOPs) appropriate and complied with
	Collection of intra-laboratory duplicates
Accuracy	WSP SOPs appropriate and complied with
	Collection and analysis of inter-laboratory duplicates
	Collection of rinsate blanks and trip blanks
Representation	Appropriate media sampled
Comparability	Adequately trained and experienced field staff
	Climatic conditions (temperature, rainfall, wind)
	Same type of samples collected
Completeness	SOPs appropriate and complied with
	All required samples collected

Table 4.2 DQIs for analytical laboratories

DQI	DESCRIPTION	ACCEPTABLE LIMIT
Precision	TRH and BTEXN in groundwater and TRH, BTEXN, PAH, metals and asbestos in soil	>10 x PQL - ±30% RPD 4-10 x PQL - ±50% RPD <4 x PQL - ± 100% RPD

DQI	DESCRIPTION	ACCEPTABLE LIMIT
	National Association of Testing Authorities (NATA) certified laboratories	NATA accreditation for analyses performed
Accuracy	Analysis of trip blanks (one per sample batch)	Non-detect for contaminants analysed
	Analysis of rinsate blanks (one per day) when non-dedicated sampling equipment is being used	Non-detect for contaminants analysed
	Analysis of field blanks	Non-detect for contaminants analysed
	Analysis of laboratory matrix spikes, laboratory control samples and surrogate recoveries	70-130% inorganics/metals 60-140% organics
	TRH and BTEXN in groundwater and TRH, BTEXN, PAH, metals and asbestos in soil	>10 x PQL - ±30% RPD 4-10 x PQL - ±50% RPD <4 x PQL - ± 80% RPD
Representativeness	All required samples analysed	As per sampling plan
Comparability	Sample analytical methods used	As per NEPM (NEPC, 2013)
	Same units	justify/quantify if different
	Same laboratories	justify/quantify if different
	Sample practical quantification limits (PQL)s	Less than nominated criteria justify/quantify if different
Completeness	All critical samples analysed	As per sampling plan
	All required analytes analysed	As per sampling plan
	Appropriate methods and PQLs	As per NEPM (NEPC, 2013)
	Sample documentation complete	As per NEPM (NEPC, 2013)
	Sample holding times complied with	As per NEPM (NEPC, 2013)

5 FIELDWORK METHODOLOGY

5.1 FIELDWORK CHRONOLOGY

The scope and rationale for the intrusive investigation and groundwater monitoring works completed as part of the current investigation are summarised in Table 5.1. These works are detailed further in the following subsections.

Table 5.1 Fieldwork chronology summary

DATE	SCOPE	RATIONALE
24/02/21 to 26/02/21	Test-pitting at 15 cleared locations Geotechnical drilling and well establishment and development	Identify the extent of possible soil contamination at the site. Understand the general indication of geotechnical conditions at the site. Locations were identified based on the proposed warehouse design that WSP was supplied with.
1/03/21	Groundwater monitoring event of three newly installed groundwater monitoring wells	Identify the groundwater flow direction and status of groundwater contamination at the site.

5.1.1 SUBSURFACE CLEARANCE SCANS

Prior to all intrusive investigations, a Dial Before You Dig search was conducted and proposed drilling locations were scanned and cleared for underground services by a certified utility locating subcontractor.

5.1.2 TEST-PITTING

Fifteen test-pitting locations were advanced using a 5T excavator to a maximum depth of 2-3 m below ground level (m BGL) or 0.5 m into natural material, whichever occurred first. All test pit locations were first cleared by a utility locating subcontractor prior to excavation. Refer to Figure 2, Appendix A for the test-pit locations.

Soil samples were collected from 0.1-0.2 m BGL, 0.5 m BGL, 1.0 m BGL, and 2.0 m BGL and within the natural material for all locations. Not all collected samples were analysed; 1 sample from each borehole was scheduled for analysis based on field observations.

All soil samples collected during the works were screened with a calibrated photoionisation detector (PID) to assess if volatile organic compounds (VOCs) were present. Samples were collected directly from the excavator bucket, using a new pair of nitrile gloves for every sample location to minimise the risk of cross-contamination.

Visual screening for asbestos, to determine asbestos percentage weight/weight for confirmed asbestos containing material (if identified), was undertaken at up to two locations per test pit. Samples for asbestos fines/fibrous asbestos (AF/FA) quantification in 500 mL bags was collected, however they were not to be analysed unless a credible friable risk was identified.

Test pits were compacted with the bucket as they were backfilled and track rolled once the material reached ground level, to minimise hazards such as trips and falls.

5.1.3 SOIL BORE DRILLING AND SAMPLING

Five soil bores (BH01-BH05) were drilled to a maximum depth of 10mBGL using solid auger drilling technique. Samples were collected within fill and natural soil and analyzed to a maximum depth of 1.0mBGL. A new pair of nitrile gloves for every sample location to minimise the risk of cross-contamination. Samples were stored on ice, in an esky while onsite and in transit to the laboratory under Chain of Custody documentation. Chain of custody documentation is

included in Appendix E. Each location was reinstated with excavated material upon completion of the soil sampling program.

5.1.4 MONITORING WELL INSTALLATION AND DEVELOPMENT

Three monitoring wells (MW01-MW03) were established by converting three of the geotechnical boreholes into groundwater wells. All wells were advanced to a maximum depth of 7 m BGL and constructed using factory prepared, Class 18, 50 mm diameter uPVC, with machine slotted screens, 2 mm sand pack and a bentonite seal placed 0.5 m above the sand pack. The well annulus, between the bentonite seal and ground, was backfilled with granular bentonite.

Groundwater wells were developed using a steel bailer to purge approximately 3 times the water column in the well. A calibrated water quality meter placed with a flow cell was used during the purging process to assess chemical equilibrium by measuring pH, redox potential (Eh), electrical conductivity, dissolved oxygen and temperature.

5.1.5 GROUNDWATER GAUGING AND SAMPLING

Groundwater monitoring of the three newly installed groundwater monitoring wells was undertaken 3 days after well development. Standing groundwater levels and the base of each well were measured at each location, using a dual-phase interface meter, which also allowed the detection of any potential NAPL. Groundwater sampling was conducted by a no-purge method, using HydraSleeve™ samplers. The HydraSleeve™ was slowly lowered into the screened section of the well to minimise disturbance and then drawn up to open the valve. When the HydraSleeve™ was full, it was slowly raised to ensure the valve stayed closed and minimise water column mixing. Samples were obtained directly from the sampler sleeve. Table D1 in Appendix D provides a summary of the monitoring well gauging data and qualitative observations of water quality.

Groundwater samples were collected in accordance with standard industry practice and WSP documented standard field procedures, ensuring the potential for cross-contamination was minimised. Samples were decanted into laboratory-supplied containers which were stored in a temperature-controlled environment for delivery to a NATA accredited laboratory. All non-disposable equipment was washed with Decon 90 and rinsed with clean water before and after each sample was collected. Disposable nitrile gloves were worn during sampling and were changed between samples to minimise the potential for cross-contamination.

5.2 LABORATORY ANALYSIS

5.2.1 SOIL ANALYSIS

Australian Laboratory Services Pty Ltd (ALS) was the primary NATA accredited analytical laboratory that performed the sample analyses. Twenty soil samples were analysed for TRH, BTEXN, polycyclic aromatic hydrocarbons (PAHs), and heavy metals, fourteen were analysed for OCPs, OPPs and eighteen were analysed for asbestos (presence/absence).

In one location, where asbestos was visually identified, a 500mL sample was analysed for AF/FA quantification analysis.

In instances where asbestos was positively identified in presence/absence samples (~50g sample), AF/FA quantification analysis was also scheduled.

Summary tables of the soil sample results have been included in Appendix C.

5.2.2 GROUNDWATER ANALYSIS

Three primary and one intra-laboratory duplicate groundwater samples were analysed at ALS, and one inter-laboratory duplicate sample was dispatched to Eurofins Environmental Pty Ltd. (Eurofins).

All groundwater samples from monitoring wells including intra- and inter-laboratory duplicates were submitted for analysis of TRH, BTEXN, PAHs, heavy metals, OCPs and OPPs.

Summary tables of the groundwater sample results have been included in Appendix D.

5.2.3 DATA QUALITY ASSURANCE

To comply with sampling quality assurance regulation, one intra- laboratory duplicate sample (QA01) and one inter-laboratory duplicate (QA01A) sample were collected for groundwater sample GW03. Duplicate and triplicate groundwater samples were analysed for TRH, BTEXN, PAHs, heavy metals, OCPs and OPPs.

One trip blank and one trip spike was transported with both the samples during the GME and soil investigation; these were analysed for $TRHC_{6}$-$C_{9\ and}$ BTEXN.

Laboratory QA/QC included the analysis of laboratory control spikes, surrogate recoveries, laboratory duplicates and method blanks for the sample batch.

Tables presenting the QA/QC testing are provided in Appendix F.

5.3 GEOTECHNICAL FIELD METHODOLOGY

5.3.1 OVERVIEW

The geotechnical investigation was completed over three days on Wednesday 24th February 2021 to Friday 26th February 2021 and comprised:

- Three (3) augered boreholes (BH01, BH03, BH04) to 7 mBGL with associated Standard Penetrometer Testing (SPT) and Pocket penetrometer (PP) testing.
- Two (2) augered / cored boreholes (BH02, BH05) to 10 mBGL with associated rock core Point Load Testing (PLT).
- Three (3) groundwater monitoring well were installed in the selected boreholes (BH03, BH04, BH05).

A summary of the completed geotechnical investigation locations is presented in Table 5.2. Investigation locations are further summarised in **Error! Reference source not found.**. Engineering logs, including SPT, PP and PLT results are presented in **Error! Reference source not found.**.

Table 5.2 Summary of completed geotechnical investigation

TYPE	INVESTIGATION ID	EASTING	NORTHING	REDUCED LEVEL (mAHD[1])	TERMINATION DEPTH (mBGL[2])	TERMINATION REASON
Augered Boreholes	BH01	293053	6263930	28	6.9	Refusal
	BH03	293008	6263860	26	7.0	Target Depth
	BH04	293086	6263894	27	7.0	Target Depth
Augered / Cored Boreholes	BH02	292999	6263901	25	10.0	Target Depth
	BH05	293107	6263816	26	10.0	Target depth

1 – Australian Height Datum

2 – Below Ground Level

5.3.2 INVESTIGATION METHODOLOGY

5.3.2.1 PRELIMINARIES

The geotechnical investigation was undertaken in accordance with the approved Health Environment and Safety Plan (HESP), WSP Ground Penetration Permits and Contractor WHS Induction.

5.3.2.2 SERVICE LOCATION

Prior to attending site, a dial-before-you-dig service search was completed and service plans for potential services collected. To determine the presence of underground services, a combination of scanning techniques was used, including a ground penetrating radar (GPR) scan and electrical resistance tomography (ERT).

The proposed cored borehole investigation locations were identified to be clear of underground utilities prior to the commencement of breaking ground.

5.3.2.3 SET-OUT AND SURVEY

Easting and northing co-ordinates for all investigation locations were extracted from a handheld GPS unit (generally accurate to approximately +/- 3 m) in Map Grid Australia (GDA 94) Zone56 format. Reduced Levels (RLs) were inferred from GPS readings.

Approximate coordinates and RLs of the investigation locations are presented in Table 5.2.

5.3.2.4 FIELD WORK

All field work was managed by an experienced WSP geotechnical engineer who was responsible for supervising drilling activities, soil and rock logging, collecting samples, directing in-situ testing and preparing engineering logs. All augered and cored boreholes were drilled using a DB8 drilling rig. A solid flight auger fitted with a V-bit was used to drill through soil. BH02 and BH05 were subsequently advanced with triple tube diamond HQ3 coring in rock.

To assess the soil strength and consistency or density of the subsurface strata, and to obtain further soil samples, Standard Penetration Tests (SPTs) were carried out in accordance with AS1289.6.3.1-2004, at nominal 1.0 – 1.5 m intervals, starting at a depth of 1.0 m below existing ground level. Pocket penetrometer (PP) testing was completed on SPT samples. Point Load Tests were carried out on recovered rock core samples at approximately 0.5-1.5m intervals, to provide an indication of the unconfined compressive strength of the rock. Groundwater monitoring wells were installed in boreholes BH03, BH04, BH05 with monument casing. Boreholes were backfilled with excess drilling spoil and grout.

All geotechnical investigation work was carried out in accordance with AS1726-2017 ‘Geotechnical Site Investigations’, where applicable.

6 ASSESSMENT CRITERIA

6.1 SOIL GUIDELINES

To assess the presence and extent of soil contamination at a site, the NEPM (2013) provides health screening levels (HSLs) for the assessment of impacted soil.

Schedule B1 of the NEPM (2013) defines health investigation levels (HILs) that have been developed for a range of metals and organic contaminants in soil. HILs are scientifically based, generic assessment criteria designed to be used in the first stage (Tier 1 or 'screening') of an assessment of potential risks to human health from chronic exposure to contaminants. The HILs are applicable to all soil types and generally apply to the top 3 m of soil. HILs have been developed for four generic land use settings:

- HIL A: Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake, (no poultry), also includes children's day care centres, preschools and primary schools)
- HIL B: Residential with minimal opportunities for soil access includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats
- HIL C: Public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary school fields and footpaths. It does not include undeveloped public open space (such as urban bushland and reserves) which should be subject to a site-specific assessment where appropriate
- HIL D: Commercial/industrial such as shops, offices, factories and industrial sites.

It is anticipated that the land zoning of the site will remain as General Industrial (IN1). As such, WSP will screen soil results against HIL D criteria to determine potential risks.

Schedule B1 of the NEPM (2013) defines health screening levels (HSLs) that have been developed for selected petroleum compounds and fractions and are applicable for assessing human health risk via the vapour intrusion and inhalation pathway. The HSLs depend on specific soil physicochemical properties and land use scenarios. They apply to different soil types and depths. The HSLs are divided into four generic land use settings which range from low density residential (HSL A) to commercial/industrial sites (HSL D). The HSLs methodology also further specifies subsurface profile, with criteria presented for sand, silt and clay soils at several depth intervals.

Similar to the HIL criteria, the soil analytical results were compared against the HSL D criteria in sand between 0-4 m. Despite the underlying soil unit predominantly being clay, the fill material contained sand in varying compositions so was used as a conservative criterion.

The HSLs for asbestos, relevant to a commercial/industrial site with accessible soils, as presented in Schedule B1 of the NEPM guidelines (NEPM, 2013, adopted from WA DoH 2009) have been adopted as the assessment criteria. The prevalence of bonded asbestos was undertaken in a semi-quantitative manner through assessment of presence or absence at a NATA accredited laboratory in potential fragments which were identified during the investigation and the comparison of AF/FA results against HSLs will be undertaken. Where potentially asbestos containing material fragments are visually identified, a NEPM quantification screening method will be undertaken.

The amended NEPM, 2013 (Schedule B1, Section 3.6) provides circumstances whereby assessment of aesthetics may be required as part of site suitability assessment. There are no specific numeric aesthetic guidelines and professional judgement is considered applicable. Professional judgement for soil aesthetics will consider a `balanced approach' when considering whether various inclusions within fill materials warrant remediation or management for aesthetic reasons. The end land use will be the primary consideration factor for aesthetic considerations. The main type of issues that relate to aesthetics include stained or discoloured soil, large volumes of inert refuse, unsightly or malodourous soils, leachate production, hydrocarbons sheens and chemical residues. Aesthetic considerations are a requirement in the NSW EPA Site Auditor Guidelines 3rd Edition (2017).

The CRC CARE Technical Report No. 10 (Friebel and Nadebaum, 2011) provides HSLs for petroleum hydrocarbons specifically for vapour inhalation for intrusive maintenance workers in shallow trenches, and for direct contact. These have also been adopted.

A summary of the adopted soil health assessment criteria is outlined in Table 6.1.

Table 6.1 Adopted soil health criteria

ANALYTE	HSL D, SAND 0 - <1m (mg/kg)[1]	HSL D, SAND 1-2 m (mg/kg)[1]	HSL D, SAND 2-4 m (mg/kg)[1]	MAINTENANCE WORKERS[2] (mg/kg)		HIL D, (mg/kg)[3]
				VAPOUR INHALATION	DIRECT CONTACT	
TRH F1	260	360	630	NL	82,000	-
TRH F2	NL	NL	NL	NL	62,000	-
TRH C_{16}–C_{34}	-	-	-	-	85,000	-
TRH C_{34}–C_{40}	-	-	-	-	120,000	-
Benzene	3	3	3	77	1,100	-
Toluene	NL	NL	NL	NL	120,000	-
Ethylbenzene	NL	NL	NL	NL	85,000	-
Total xylenes	230	NL	NL	NL	130,000	-
Naphthalene	NL	NL	NL	NL	29,000	-
Benzo(a)pyrene TEQ	-	-	-	-	-	40
PAHs (sum)	-	-	-	-	-	4,000
Arsenic	-	-	-	-	-	3,000
Cadmium	-	-	-	-	-	900
Chromium (VI)	-	-	-	-	-	3,600
Copper	-	-	-	-	-	240,000
Lead	-	-	-	-	-	1,500
Mercury	-	-	-	-	-	730
Nickel	-	-	-	-	-	6,000
Zinc	-	-	-	-	-	400,000

(1) NEPM (2013) Schedule B1 - Investigation levels for soil and groundwater
(2) CRC CARE (2011) Technical report No. 10
(3) NEPM (2013) Health Investigation Levels
NL: Not limiting. A 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

The NEPM (2013) also outlines ecological investigation levels (EILs) developed for selected metals and organic substances. These are applicable for assessing risk to terrestrial ecosystems. EILs depend on specific soil physicochemical properties and land use scenarios and generally apply to the top 2 m of soil. EILs have been developed for three generic land use settings:

- areas of ecological significance

- urban residential areas and public open space
- commercial and industrial land uses.

Soil results were compared to commercial and industrial land use criteria. Additional soil parameters are required to calculate EILs for chromium, copper, nickel and zinc, and were based on the most conservative added contaminant limits outlined in the NEPM (2013), recognizing this is a very conservative approach as these figures are generally added to the background concentrations onsite to develop site specific EILs.

Ecological screening levels (ESLs) have been also been developed for selected petroleum hydrocarbon compounds and TRH fractions and are applicable for assessing risk to terrestrial ecosystems. ESLs broadly apply to coarse and fine-grained soils and various land uses and, like EILs, are generally applicable to the top 2 m of soil. As with health-based screening levels, these criteria are screening criteria only; exceedances of these criteria are triggers to undertake additional assessment of the risk to terrestrial ecosystems.

The amended NEPM 2013 Management Limits for TRH are applied after the consideration of the relevant HSLs and ESLs as there are a number of policy considerations which reflect the nature and properties of petroleum hydrocarbons. There are Management Limits for specific soil types (coarse and fine) and land uses in the amended NEPM 2013. Soils have been compared against the commercial and industrial land use criteria for a coarse soil.

Where sample results exceed the adopted site criteria and do not meet the statistical conditions above, management of soils may be required via remediation or other site management requirements.

A summary of the adopted soil ecological assessment criteria is outlined in Table 6.2.

Table 6.2: Adopted soil ecological criteria

ANALYTE	GENERIC EIL COMM/IND, (mg/kg)[1]	ESL COMM/IND, COARSE SOIL (mg/kg)[1]
TRH C_6-C_{10}	-	-
TRH C_{10}-C_{16}	-	170
TRH C_{16}–C_{34}	-	1,700
TRH C_{34}–C_{40}	-	3,300
Benzene	-	75
Toluene	-	135
Ethylbenzene	-	165
Total xylenes	-	180
Naphthalene	370	-
Benzo(a)pyrene TEQ	-	1.4
PAHs (sum)	-	-
Arsenic	160	-
Cadmium	-	-
Chromium (III+VI)	310	-
Copper	85	-
Lead	1,800	-
Mercury	-	-

ANALYTE	GENERIC EIL COMM/IND, (mg/kg)[1]	ESL COMM/IND, COARSE SOIL (mg/kg)[1]
Nickel	55	-
Zinc	110	-
DDT	640	

6.2 GROUNDWATER GUIDELINES

WSP has applied guidance from Schedule B1 of NEPM 2013 in selection of site criteria for health (via vapour intrusion and drinking water pathways) and ecological receptors. Guideline values are listed in Table 6.3. The NEPM ecological criteria are based on ANZECC 2000 criteria that have been updated in the ANZG, 2018 guidance.

It is noted that HSLs are only relevant to dissolved phase hydrocarbons. Where phase separated hydrocarbons (PSH) is present HSLs should not be used. It must be assumed that HSLs for some contaminants, if present, may be exceeded. The only component of diesel likely to represent risk a vapour risk is the F2 fraction. Sub-slab vapour monitoring is helpful in assessing the actual risks presented by PSH.

Application of NEPM ecological criteria as "groundwater" investigation criteria is a conservative approach as the guidelines were derived for receiving waters. The closest downgradient ecological receptor is a dry vegetated channel located along the southern boundary of the site. It is assumed that this is the main drainage point of the site, which would feed into the closest surface water body which is a tributary of South Creek. The creek feeds into South Creek, 400 m west of the site. South Creek is a freshwater creek, so the freshwater criteria has been adopted (despite the groundwater being highly saline).

Schedule B1 of the NEPM (2013) defines groundwater investigation levels (GILs) that have been developed for a broad range of metals and organic contaminants in groundwater. GILs are based on the following guidelines:

- Australian and New Zealand Conservation Council/Agriculture, and Resource Management Council of Australia and New Zealand 2000, National water quality management strategy. *Australian and New Zealand guidelines for fresh and marine water quality***.** This guideline has been superseded by an online resource prepared by the Australian and New Zealand Governments (ANZG) in 2018. The criteria for the contaminants of concern for this investigation remain as listed in the NEPM (2013) and ANZECC (2000).
- National Health and Medical Research Council (NHMRC)/National Resource Management Ministerial Council (NRMMC) 2011, *Australian Drinking Water Guidelines 6* (Version 3.5, updated August 2018); and
- NHMRC 2008, *Guidelines for Managing Risk in Recreational Waters*.

The GILs do not provide data for all BTEX compounds and PAHs; however, as the GILs are based on the ANZECC/ARMCANZ (2000) water quality guidelines, low reliability trigger values for fresh and marine waters from for BTEX and PAHs compounds can be considered.

Schedule B1 also provides a framework for assessing the human health risk from petroleum compounds and fractions via the inhalation and direct contact pathways through the development and implementation of HSLs. The adopted carbon fraction ranges for the HSLs are based on TRH analysis after subtraction of BTEX compounds and naphthalene.

The HSLs are divided into four generic land use settings which range from low density residential (HSL A & B) to commercial/industrial sites (HSL D). The HSL methodology also further specifies subsurface profile, with criteria presented for sand, silt and clay soils at several depth intervals. Where there is reasonable doubt as to the appropriate soil texture to select, either a conservative selection should be made (i.e. sand) or laboratory analysis carried out to determine particle size and hence soil texture sub-class. The NEPM (2013) HSLs for groundwater in sand have been considered.

The NEPM (2013) HSLs provide an indicative risk to receptors from vapours that could emanate from contaminated groundwater.

To assess the potential risk to on-site receptors, the groundwater results were compared to the commercial/industrial HSL criteria and to assess the potential risk to off-site receptors, results were compared to ecological criteria.

For this assessment groundwater results were screened against the following criteria:

- NEPM (2013) HSL-D (comm/ind) for vapour intrusion in sand (>4 m BGL);
- ANZG (2018) 95% Protection of species for fresh waters;
- NHMRC (2018) Recreational waters; and
- NEPM (2013) GILs for Fresh waters.

A summary of the adopted groundwater assessment criteria is outlined in Table 6.3.

Table 6.3 Adopted groundwater assessment criteria

ANALYTES	HSL - D COMMERCIAL/ INDUSTRIAL 2 TO <4 m (SAND)[1] µg/L	ANZG 95% PROTECTION FRESHWATER ECOSYSTEM GUIDELINES [2] µg/L	NHMRC, 2008 RECREATIONAL CRITERIA (10 × HILS) µg/L	NEPM, 2013 GILS FOR MARINE WATER µG/L
TRH C_6–C_{10} less BTEX (F1)	6,000	-	-	
TRH >C_{10}–C_{16} less naphthalene (F2)	NL	-	-	
TRH C_{10}-C_{40} (Sum)	-	-	-	
Benzene	5,000	950	10	
Toluene	NL	-	3,000	
Ethylbenzene	NL	-	8,000	
o-Xylene	-	-		
m-, p-Xylene	-	-		
Total xylene	NL	-	6,000	
Naphthalene	NL	16		
Arsenic	-	-24	100	
Cadmium	-	5.5	20	
Chromium	-	4.4	500	
Copper	-	1.3	20,000	
Lead	-	4.4	100	

ANALYTES	HSL - D COMMERCIAL/ INDUSTRIAL 2 TO <4 m (SAND)(1) µg/L	ANZG 95% PROTECTION FRESHWATER ECOSYSTEM GUIDELINES (2) µg/L	NHMRC, 2008 RECREATIONAL CRITERIA (10 × HILS) µg/L	NEPM, 2013 GILS FOR MARINE WATER µG/L
Mercury	-	0.4	10	
Nickel	-	70	200	
Zinc	-	15	-	

(1) NEPM (2013) Schedule B1, Table 1A(4) *Groundwater HSLs for vapour intrusion*, commercial/industrial setting in sand

(2) ANZAST (2018) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality Guidelines* - Freshwater Ecosystem (95% species protection)

NL: Non-limiting, maximum potential vapour concentration in soil vapour do not exceed maximum allowable vapour risk

6.3 AESTHETIC CONSIDERATIONS

In addition to human health and ecological criteria, aesthetic concerns were assessed based on field observations. Issues to be considered include:

- highly malodorous soils e.g. strong residual petroleum hydrocarbon odours; and
- discoloured chemical deposits or soil staining with chemical waste other than of a very minor nature.

Site assessment requires consideration of the quantity, type and distribution of foreign material or odours in relation to the specific land use and its sensitivity.

7 RESULTS AND DISCUSSION

7.1 FIELD OBSERVATIONS AND PROFILE

The majority of the site is vacant and covered in overgrown weeds and grass. Along the northern and western portions, the soil surface was covered with large shale 'boulders' and gravels and some anthropogenic materials, such as bricks, plastic pipes and plastic fragments.

In the south-eastern portion (TP06, TP07 and TP08), minimal fill material was observed. Across the majority of the site in the central and southern portions (TP02, TP03, TP05, TP09, TP10, TP12, TP14 and TP15), fill material was encountered up to approximately 0.5 m BGL. In these locations, the test pits were advanced to approximately 1.0 m BGL or 0.5 m into natural material. Along the northern boundary and in the western portions of the site (TP01, TP04, TP11 and TP13), larger quantities of fill material were encountered from approximately 1.2 m BGL until greater than 3.0 m BGL (maximum of test pit depth). These locations reflected where the natural topography would have fallen away and so had been levelled with fill material. Fill material generally encountered consisted of brown silty sandy clay with gravels. Gravel inclusions consisted of shale and some sandstone. Inert anthropogenic inclusions such as bricks, glass, tiles and plastic were also observed at most locations. Fiber cement sheet fragments (later confirmed as containing asbestos) were observed in TP09 at 0.5 m BGL.

Underlying the fill material, the soil profile consisted of grey/red clay. The clay was generally moderately stiff and of moderate to high plasticity becoming stiffer with depth. In some locations, red/orange ironstone gravels were encountered towards the bottom of the test pit.

No odours were detected in the fill or natural material. PID field readings were from 1.1 ppm to 5.3 ppm indicating no significant volatiles were encountered, consistent with the visual and odour observations.

7.2 SOIL ANALYSIS

A summary of soil analytical results is presented in Table C1 presented in Appendix C. Key findings included:

- Concentrations of total recoverable hydrocarbons (C_6-C_{40}), PAH, OPPs were either below the adopted site assessment criteria or laboratory LORs.
- Heavy metals were generally detectable (with the exception of cadmium and mercury). Concentrations of copper (TP03_0.5), nickel (BH01_0.2) and zinc (BH01_0.2, TP04_0.5 and TP13_0.5) exceeded the NEPM (2013) Generic EIL criteria for a commercial/industrial land use, but these were all less than health-based criteria. All other heavy metals concentrations were below adopted health and ecological site criteria.
- Xylene was detected above laboratory LORs in one sample (TP04_0.5), however it was below adopted site criteria. All other concentrations of BTEXN were below laboratory LORs.
- OCPs were detected above laboratory LORs in two samples (TP09_0.5 and TP13_0.5), however all concentrations were below adopted site criteria. All other concentrations of OCPs were below laboratory LORs.
- Soil asbestos testing results are summarized in Table C2. Key findings with respect to asbestos include: Asbestos was visually screened for weight on weight concentrations in all 15 test-pit locations. One sample from most test pits and borehole locations were analysed (presence/absence).
- A total of 17 locations were analysed. Chrysotile was identified in 4 locations (BH02_1.0, TP05_0.5, TP09_0.5 and TP14_0.1) and crocidolite was also identified in 2 of these locations (TP05_0.5 and TP14_0.1). As a results WSP requested additional NEPM quantification analyses on all these samples.

- Quantification test results indicated that the bonded components in all cases was less than the NEPM criteria, however the AF/FA result for BH02_1.0 failed the site criteria.

7.3 GROUNDWATER

The groundwater monitoring event was undertaken on the 1 March 2021.

7.3.1 GROUNDWATER FLOW

The standing water level of groundwater from the monitoring well network ranged from 2.544 m BTOC to 6.293 m BTOC on 1 March 2021. The groundwater gradient was estimated using approximate heights (m AHD) from Google Earth (2021). These calculations are presented in Table D1.

From the current investigations and inferred directions from the EDD report (WSP, 2020), groundwater flow is expected to be in the southern direction towards the dry channel which will eventually flow towards a tributary of South Creek. This flow is supported by inferred regional flow, topography and hydrology. Inferred groundwater contours can be found in Figure 4, Appendix A.

No phase separated hydrocarbons existing as either LNAPL or DNAPL were identified in any of the gauged on-site wells.

7.3.2 PHYSICAL PARAMETERS

The groundwater conditions at the site during the groundwater monitoring event on 1 March 2021 are presented in Table D1 and in summary showed:

- the pH of groundwater ranged between 5.94-6.16, indicating slightly acidic conditions;
- the electrical conductivity ranged between 24,234 – 31,197 µS/cm, indicating saline conditions, typical of the Wianamatta group sediments in this part of Sydney;
- the oxidation reduction potential ranged between 247.8 – 292.0 mV, indicating slightly reducing conditions;
- the dissolved oxygen content ranged 2.72 - 4.06 ppm, indicating slightly oxygenated water (30-50 % saturated); and
- the temperature ranged between 22.9 – 25.3°C.

7.3.3 ANALYTICAL RESULTS

An analytical results summary is provided in Table D2 of Appendix D. Laboratory reports and chain of custody documentation is provided in Appendix E. Groundwater results indicated:

- Concentrations of copper, nickel and zinc were detected in all wells in exceedance of the ANZG (2018) freshwater 95% toxicant criteria. Concentrations of cadmium were also detected in GW01 and GW02 in exceedance of the ANZG (2018) criteria.
- All other concentrations were either reported below adopted site criteria or below laboratory LOR.

7.4 GEOTECHNICAL RESULTS SUMMARY

The full GIR is included in Appendix H.

7.4.1 SUBSURFACE CONDITIONS AND GROUND MODEL

Based on the results of the geotechnical investigation, the geology identified across the site is consistent with the regional geology indicated by the 1:100,000 Penrith Geological map. The ground profile across the site extents can be generally summarised as follows:

- Fill, typically comprising sandy gravel and gravelly clay, overlying
- Residual Soils, typically comprising silty/sandy clay, overlying
- Weathered Rock (inferred Bringelly Shale) ranging from low to medium strength, highly to slightly weathered.

For geotechnical characterisation of the sub-surface conditions and to inform engineering design, the soil and rock types encountered across the site extents have been generalised into the Geotechnical Units presented in Table 7.1. The depth and thickness of the Geotechnical Units summarised are limited to the extents of the geotechnical investigation.

Table 7.1 Summary of subsurface conditions and inferred ground model

GEOTECHNICAL UNIT	GENERALISED DESCRIPTION	DEPTH TO TOP OF UNIT (mBGL)	THICKNESS (m)
1.Fill (BH01, BH02, BH03)	Sandy Gravel / Gravelly Clay Fine to coarse grained gravel Sub-angular sub-rounded Medium to high plasticity clay Fine to medium grained sand Brown to grey	0	0.8 to 0.9
2. Residual Soil	Silty/Sandy Clay Medium to High plasticity Fine grained sand Pale grey mottled red/orange	0.2 to 0.9	4.1 to 5.7
3a. Weathered Rock	Extremely weathered Very low strength Grey to brown Recovered as Silty Clay	5.0 to 6.0	1.8 to 3.1
3b. Weathered Rock (BH02, BH05)	Highly to slightly weathered Low to medium strength Pale grey/brown to dark grey Class III Shale and Laminite	7.4 to 8.4	Not Penetrated. Drilled to max. depth of 10.00

Rock classes assessed in accordance with Pells et all (2019) "Classification of Sandstones and Shales in the Sydney Region: A Forty Year Review", June 2019.

7.4.2 GROUNDWATER

Review of the Australian Bureau of Meteorology Groundwater Exploration Database (accessed 11 September 2020), including historical bores in the vicinity of the site, indicates that groundwater has previously been encountered at shallow depth, about 1.5 mBGL.

Groundwater was encountered during V-bit augering except BH05 and ground water monitoring wells were installed in BH03, BH04 and BH05 following completion of drilling. The groundwater level encountered and monitoring well details are listed in Table 7.2.

It should be noted groundwater levels may vary due to climatic and seasonal conditions and therefore, the observations at the time of the geotechnical investigation may not represent the long-term groundwater conditions or conditions that may be encountered during construction phases.

Table 7.2 Groundwater levels and monitoring well installation summary

BOREHOLE ID	GROUNDWATER LEVEL ENCOUNTERED (mBGL)	BOTTOM OF GROUNDWATER MONITORING WELL (mBGL)	GROUNDWATER MONITORING WELL SCREEN (m)
BH01	5.3	N/A	N/A
BH02	3.5	N/A	N/A
BH03	5.0	7	3
BH04	5.0	7	3
BH05	Not Encountered	7	4

7.4.3 LABORATORY TESTING

Selected disturbed soil samples were collected from the boreholes and sent to Resource Laboratories Pty Ltd (Resource Labs), a NATA-accredited soil laboratory. Scheduled lab tests are listed in Table 7.3 with laboratory test certificates provided in Appendix H Attachment C.

Table 7.3 Geotechnical laboratory testing schedule

LAB TEST	BOREHOLE ID	SAMPLE DEPTH (mBGL)	DATE SAMPLED
Moisture Content (AS 1289.2.1.1)	BH02	1.00-1.45	25/02/2021
	BH04	3.00-3.45	24/02/2021
	BH05	4.00-4.45	24/02/2021
Atterberg Limits (LL, PL, PI and LS) (AS 1289.3.1.2, 3.2.1, 3.3.1; AS 1289.3.4.1)	BH01	2.50-2.95	26/02/2021
	BH03	2.50-2.95	25/02/2021
	BH05	2.00-2.45	24/02/2021
CBR (4-day soak) AS 1289.6.1.1 4.5 kg Surcharge, Remoulded ratio @ 98%	BH01	1.00-1.20	26/02/2021
	BH03	2.00-2.20	25/02/2021
PSD (AS1289.3.6.1)	BH02	2.50-2.95	25/02/2021
Soil Aggressivity (pH, SO4, CI) (APHA)	BH03	4.00-4.45	25/02/2021
	BH04	1.00-1.45	24/02/2021
	BH05	1.00-1.45	24/02/2021
Linear Shrinkage (1289.3.4.1)	BH01	5.50-5.95	26/02/2021
	BH02	4.00-4.45	25/02/2021
	BH05	5.00-5.45	24/02/2021

7.4.3.1 GEOTECHNICAL TEST RESULTS

Geotechnical laboratory test results are provided in Table 7.4 to Table 7.7.

Table 7.4 Moisture content test results

BOREHOLE ID	SAMPLE DEPTH (mBGL)	MATERIAL	MOISTURE CONTENT, MC (%)
BH02	1.00-1.45	Silty CLAY	15.7
BH04	3.00-3.45	Silty CLAY	15.4
BH05	4.00-4.45	Silty CLAY	15.3

Table 7.5 Atterberg Limits test results

BOREHOLE ID	SAMPLE DEPTH (mBGL)	MATERIAL	USCS SYMBOL	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	LINEAR SHRINKAGE (%)
BH01	2.50-2.95	Silty CLAY	CL-CI	37	12	25	14.0
BH01	5.50-5.95	Silty CLAY	-	ND	ND	ND	11.0
BH02	4.00-4.45	Silty CLAY	-	ND	ND	ND	13.5
BH03	2.50-2.95	Silty CLAY	CL-CI	36	12	24	14.5
BH05	2.00-2.45	Silty CLAY	CL	34	12	22	10.0
BH05	5.00-5.45	Silty CLAY	-	ND	ND	ND	14.5

USCS = Unified Soil Classification System

ND = Not Determined

Table 7.6 CBR test results

BOREHOLE ID	SAMPLE DEPTH (mBGL)	MATERIAL	MAXIMUM DRY DENSITY (t/m^3)	OPTIMUM MOISTURE CONTENT, OMC (%)	CBR (%)
BH01	1.00-1.20	Silty CLAY; with sand and gravel	1.90	12.8	6.0
BH03	2.00-2.20	Silty CLAY; trace gravel	1.60	22.8	4.0

Table 7.7 PSD test results

			PERCENTAGE PASSING SIEVE SIZE (mm)				
BOREHOLE ID	SAMPLE DEPTH (mBGL)	MATERIAL	0.600	0.425	0.300	0.150	0.075
BH02	2.50-2.95	Silty CLAY	100	99	98	83	61

7.4.3.2 CHEMICAL TEST RESULTS

Soil chemical laboratory test results are provided in Table 7.8.

Table 7.8 Chemical laboratory test results

BOREHOLE ID	SAMPLE DEPTH (mBGL)	pH	SULPHATE (SO_4^{2-}) (mg/kg)	CHLORIDE (mg/kg)
BH03	4.00-4.45	5.3	40	1040
BH04	1.00-1.45	4.9	120	640
BH05	1.00-1.45	4.7	70	750

7.4.4 GEOTECHNICAL DESIGN PARAMETERS

A set of engineering geotechnical design parameters have been developed for the adopted Geotechnical Units across the site extent. These properties are representative values typical of the geotechnical conditions encountered at the site. The design parameters have been developed based on interpretation of all geotechnical investigation results, consideration of published correlations and engineering judgement.

During construction phases, all materials encountered should be inspected, compared, and verified with the parameters adopted during the design process by an experienced geotechnical engineer.

The soil design parameters presented in Table 7.9 are intended for use with Ultimate Limit State (ULS) and Serviceability Limit State (SLS) design approaches, using appropriate design standards with associated strength reduction and load factors applied accordingly.

Table 7.9 Summary of geotechnical design parameters for adopted geotechnical units

GEOTECHNICAL UNIT	CONSISTENCY / STRENGTH	BULK UNIT WEIGHT γ (kN/m^3) [1]	UNDRAINED SHEAR STRENGTH CU (kPa) [2]	EFFECTIVE COHESION C' (kPa) [2]	EFFECTIVE FRICTION ANGLE Ø' (DEG) [2]	DRAINED POISSON RATIO v' [2]	ELASTIC MODULUS E' (MPa) [2]
1[3]	Variable	18	-	-	35	-	-
2	Stiff to Very Stiff	19	150	7	27	0.3	15
3a	Very low	22	250	10	30	0.3	75
3b	Low to Medium	24	N/A	25	32	0.2	400

1. Bulk unit weight inferred from Table D1, Appendix D AS4678: 2002 (Earth Retaining Structures)

2. Values based on published literature and engineering judgement with similar materials

3. Fill material is inherently unsuitable and would typically be removed and replaced. However, select preliminary geotechnical parameters have been provided to allowing retaining wall back analysis, where appropriate

7.4.5 SITE CLASSIFICATION

Site classification in accordance with AS2870-2011 (Residential Slabs and Footings) is based on the expected ground surface movements and depth to which the movements extend. Sites where ground movement is predominantly due to soil reactivity under normal conditions are classified from lowest to highest reactivity (Classes A, S, M, H1, H2 to E). Although not fully applicable to the design of commercial developments as per the site redevelopment, an assessment in accordance with AS2870-2011 provides an indicative framework for foundation design.

Based on the subsurface profile encountered and with reference to Table 2.1 of AS2870-2011 the site could reasonably be taken to have a soil reactivity classification of M based on a clayey residual soil profile between 0.2 m and 6.0 m over weathered rock. This means that the site soil could experience moderate ground movement from moisture changes. Ground surface movements are expected to be in the range of 20 mm to 40 mm for a class M site.

It is worth noting also that due to the presence of FILL encountered during the investigations, assessments also show that the site soil reactivity could be defined as Class P (problem site).

7.4.6 DURABILITY ASSESSMENT

Following receipt of the soil chemical test results, an assessment was undertaken to provide a durability classification in accordance with AS 2159 – 2009 *Piling – Design and installation*.

An exposure classification has also been assessed in accordance with AS 3600 – 2009 *Concrete structures*.

Based on chemical laboratory test results, an exposure classification for concrete of "mild" is recommended in accordance with AS 2159-2009. An exposure classification of "non-aggressive" is also recommended for steel.

In accordance with AS 3600-2009, an exposure classification of B1 is recommended for buried concrete.

7.4.7 EARTHQUAKE SITE CLASSIFICATION

AS/NZS 1170-2007 Part 4 *Earthquake actions in Australia* requires designers to consider the effects of earthquakes. The design is influenced by a hazard factor (based on the probability of an earthquake occurring) and the classification of the site (based on the subsoil strength and thickness).

The hazard factor (Z) for this site should be taken as 0.08 as per Table 3.2 of AS/NZS 1170.4, which is the nominated value for the region encompassing the site. The hazard factor quoted in the standard is based on a 1 in 500-year probability of exceedance.

The site sub-soil classification recommended for this site is C_e (Shallow soil site) as per Section 4 of AS/NZS 1170.4.

8 QUALITY ASSURANCE / QUALITY CONTROL

Data quality is typically discussed in terms of accuracy, precision and representativeness. In order to assess the quality of the data collected during the investigation program, specific QA/QC procedures were implemented during both the field sampling and laboratory analysis programs, in accordance with the requirements of the following documents:

- Australian Standard (2005) *Guide to the investigation and sampling of sites with potentially contaminated soil Part 1: Non-volatile and semi-volatile compounds* AS4482.1-2005.
- Australian/New Zealand Standard (1998) *Water quality - Sampling, Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples*. AS/NZS 5667.1:1998.
- National Environment Protection (Assessment of Site Contamination) Measure (ASC NEPM) 1999 (as amended in 2013) (No. 1) (ASC NEPM, 1999).

8.1 FIELD QA/QC

Field sampling procedures conformed to WSP's QA/QC protocols to prevent cross-contamination, preserve sample integrity and allow for collection of a suitable dataset from which to make technically sound decisions.

- **Intra-laboratory replicate (blind replicate) samples:** submitted to the same (primary laboratory) to assess variation in analyte concentrations between samples collected from the same sampling point and/or the repeatability (precision) of the analytical procedures.
- **Inter-laboratory replicate (split) samples:** submitted to a second laboratory to check on the analytical proficiency (accuracy) of the results produced by the primary laboratory.
- **Trip blank and trip spike**: used to assess whether cross-contamination may have occurred between samples during transport.

Relative percentage differences (RPDs) were calculated for the primary and duplicate samples to assess the data quality, particularly for the assessment of the reproducibility (precision) and closeness of reported data to the true value (accuracy) of the analytical data measurements for the adopted field and laboratory methods. The RPDs were calculated using the formula below; the results are presented in the Table F1 and Table F2 in Appendix F.

$$RPD\% = \frac{|Ro - Rd|}{|(Ro + Rd)/2|} \times 100\%$$

where Ro is the primary sample and Rd is the primary duplicate.

The RPD values were compared to the acceptance criteria outlined in Section 4.2. RPDs for results less than the laboratory LOR were not calculated.

Table 8.1 indicates conformance to field QA/QC procedures.

Table 8.1 Field QA/QC procedures

QA/QC REQUIREMENT	COMPLETED	COMMENTS
Appropriate sampling strategy and representative samples collected	Yes	The sampling strategy has been based on the Australian Standards and WSP Field Procedures
Calibration of field equipment	Yes	The PID, interface probe and water quality meter were calibrated by the rental equipment company prior to use on site. Calibration Certificates are included in Appendix G for review.

QA/QC REQUIREMENT	COMPLETED	COMMENTS
Appropriate and well documented sample collection, handling, logging, transportation and decontamination procedures	Yes	Sample collection and transportation was conducted in accordance with WSP Contaminated Land Management procedures which have been developed in accordance with published industry guidelines, standards and best practice.
Chain of custody documentation	Yes	Samples were transported under chain of custody procedures and signed chain of custody documents are included in Appendix E.
Required number (1:20) of blind field duplicates collected	Yes	A total of 49 primary soil samples were collected with 20 analysed, and 3 primary groundwater samples were collected and analysed as part of the ESA. One intra-laboratory and inter-laboratory duplicate samples were collected and analysed during the soil investigation. In addition one intra-laboratory and one inter-laboratory duplicate samples were collected and analysed during the groundwater investigation. This met the rate of sampling of 1 in 20 primary samples.
Acceptable soil and water QC sample RPD results	Yes	The RPD values were compared to the adopted DQIs. No RPD exceedances against the DQIs were recorded for soils. One minor exceedance for groundwater in the inter-laboratory duplicate was found for C_{16}-C_{34}. For this pair the duplicate returned a detection of 300 ug/L while the primary sample returned a non-detect reading at a limit of reporting of 100 µg/L – this resulted in an RPD of 100%. Both results are very near to the limit of reporting and there are no criteria for this substance. The result does not indicate a significant concern on the site and the differences in the reporting are likely to be due to minor differences in methodology between the two labs or possibly minor sample heterogeneity. Refer to the tabulated results in Appendix F.
Required number of trip blanks and trip spikes	Yes	One trip blank and one trip spike was transported with each batch of samples sent to the laboratory meeting the DQIs for the project.
Acceptable trip blank and spike results	Yes	Trip blank and spike results are included in the laboratory certificates included in Appendix E. All blank results were reported below the laboratory LORs indicating cross contamination in transit was unlikely. All trip spikes showed acceptable recoveries indicating that volatile losses in transit were unlikely to be significant.
Samples delivered to laboratories within sample holding times and with correct preservative(s)	Yes	Samples were delivered to the laboratories within the sample holding times and in laboratory-supplied containers prepared with the appropriate preservative (where required) for the majority of samples.

8.2 LABORATORY QA/QC

Laboratory QA procedures generally include the performance of a number of internal checks of data precision and accuracy that are aimed at assessing possible errors associated with sample preparation and analytical techniques. The

DQIs adopted for the project are presented in Section 4.2. Table 8.2 indicates conformance to laboratory QA/QC procedures.

Table 8.2 Laboratory QA/QC procedures

QA/QC REQUIREMENT	COMPLETED	COMMENTS
Samples extracted and analysed within relevant holding times	Yes	Samples were extracted and analysed within the relevant holding times for all analytes.
All analyses NATA accredited	Yes	ALS and Eurofins MGT are NATA accredited for the analyses performed with the exception of AF/FA (asbestos) which is currently unable to be NATA accredited for the detection limits required. Refer to laboratory reports in Appendix E.
Acceptable laboratory LORs adopted	Yes	Refer to laboratory reports in Appendix E.
Acceptable laboratory QC results	Yes	The results of internal laboratory quality control procedures are provided within the laboratory analysis reports (Appendix E). — Method blanks all within acceptable range. — Laboratory duplicates were generally within the acceptable ranges with the exception of lead and nickel (primary soil laboratory report), zinc (secondary soil laboratory report), PAH/phenols, pesticides and TRH (primary water laboratory report) and TRH (secondary water laboratory report). However, the reported exceedances in RPDs pass the ALS and Eurofins Environment Testing's QC – Acceptance Criteria. — Matrix spike % recoveries were generally within acceptable ranges, with the exception of benzo(g,h,i)perylene (secondary soil laboratory report) and pesticides, PAH/phenols and TRH (primary water laboratory report). However, the reported exceedances in RPDs pass the ALS and Eurofins Environment Testing's QC – Acceptance Criteria. — Laboratory recoveries were all below the limit of reporting. — Laboratory blanks were all below the limit of reporting.

8.3 QUALITY STATEMENT

Overall, the data is considered to be suitable for the purpose of the investigation. QA/QC tables are presented in Appendix F.

9 CONCEPTUAL SITE MODEL

The aim of the CSM is to define source-pathway-receptors linkages that, if identified, indicate that potential human and/or environmental risks may be present. The CSM is based on the ongoing land use of the site and immediate surrounds. The CSM has been developed on the basis that in the event that no plausible linkages exist, then no significant risk is considered to be present. Therefore, the CSM specifically focusses on the plausible linkages between the three aspects (i.e. source, pathway and receptor) based on the specified scenarios.

9.1 SOURCE IDENTIFICATION

Likely sources of impact at the site is the fill material. The depth of the fill material ranges from 0.2 m BGL in the eastern portion of the site to greater than 3 m BGL in the north-western portion. This fill material was predominantly homogenous across the site.

It is not clear from historical aerials when the fill material may have been introduced, however considering the regional topography slopes towards the west, it is likely that mass fill material was imported to level the site, any time from approximately 1965 to the present day. The ACM found is likely to have been imported to the site within the fill material.

The exceedances of copper, zinc and nickel in the soil were found within the fill profile. The assessment criteria that the concentrations have exceeded (ecological added contaminant limits) is conservative and not adjusted for the onsite conditions.

The elevated concentrations of cadmium, copper, nickel and zinc in the groundwater are potentially a result of naturally high heavy metals within the Wianamatta group sediments and in highly saline conditions. However, detectible concentrations of cadmium, copper, nickel and zinc were identified in soil material throughout the site and may also be contributing to the observed groundwater concentrations.

9.2 CONTAMINANT TRANSPORT AND EXPOSURE PATHWAYS

Based on the nature and distribution of impacts identified during this investigation and site hydrogeology, anticipated primary transport mechanisms for the migration of identified contaminants are:

- Vertical migration of contaminants in soil into the underlying groundwater via leaching and dissolution or under the influence of gravity;
- Lateral migration of contaminated groundwater off-site, potentially affecting nearby surface water bodies; and
- Direct contact or inhalation of dust from localised soil impacts, asbestos or direct contact with contaminated groundwater during excavation/intrusive works at the site.

9.3 ASSESSMENT OF PATHWAYS AND RECEPTORS

Future intrusive construction workers may be exposed to contaminated soils and groundwater through direct contact (via dermal contact and potential ingestion/absorption through skin). The majority of reported contaminant concentrations do not exceed the adopted site criteria.

Considering the detection of asbestos across the site within a fifth of the samples analysed, there is a possibility for more asbestos to be present within the fill material. The AF/FA result that failed the NEPM criteria is not of immediate concern to site users as it was from a sampled found at 1.0 m depth. However, it is recommended that further delineation of the asbestos in the fill material is made as the assessment to date has been of a limited nature, and less than the

recommended minimum sampling density for a site of this area. Additional assessment will enable appropriate recommendations for asbestos management during the development of the site.

Groundwater is inferred to be migrating in an approximate southerly direction. The nearby drainage line south of the site appears to be ephemeral at best and likely largely flows only as stormwater. Therefore, groundwater is likely to be discharging to South Creek, approximately 400 m to the south of the site.

Based on the concentrations of heavy metals in the groundwater, the likelihood that they represent a regional natural occurrence and the proximity to the receiving waters, there is considered to be no likely significant groundwater risk to off-site ecological receptors posed by the site itself.

9.4 DUTY TO REPORT CONTAMINATION

Under the *Contaminated Land Management Act 1997*, a landowner or person whose activities have contaminated land have a duty to report land that has been contaminated to the EPA where certain factors have been triggered as per Section 2.3 of *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997*.

The above CSM indicates that no factors were triggered during the ESA, hence WSP considers that there is currently no Duty to Report site contamination to the NSW EPA. Rationale for this position, given there were some exceedances of criteria, include that:

- The guideline is not meant to capture instances of bonded asbestos;
- Friable asbestos is notifiable if it exceeds the guidelines AND a person has been, or foreseeably will be, exposed – which is not the case based on the data available at this time; and
- The guideline is not meant to capture instances of region background or diffuse urban pollution in groundwater, not attributed to a specific commercial activity.

Further work is recommended with respect to delineation and characterisation of the asbestos impacts (see Section 10). Future evaluation of whether there is a duty to notify will need to be considered once that work is complete.

10 CONCLUSIONS AND RECOMMENDATIONS

EMKC on behalf of Concrete Estates commissioned WSP to undertake an ESA at 2/65 Dunheved Circuit, St Mary's, to satisfy the following outcomes:

- To provide a general indication of site soil and groundwater conditions with respect to likely or possible contamination sources prior to redevelopment;
- Assess the nature and extent of any potentially contaminated fill material;
- To provide a general indication of geotechnical conditions at the site;
- Assess the risks associated with potential contamination impacts to any potential on or off-site receptor; and
- Provide recommendations on the management of site contamination (if any) and geotechnical conditions in relation to the construction of the proposed warehouse.

Test pitting works were undertaken across the site to understand the extent and nature of the fill material. From a review of historical aerials, it was determined that fill material would have been introduced any time from approximately 1965 onwards to level out the natural slope of the site to the north west.

Fifteen test pits were advanced to a maximum depth of 3 m BGL and it was determined that the fill material extended from 0.2 m BGL in the eastern portion of the site to greater than 3 m BGL in the north-western portion of the site.

Concentrations of heavy metals in three locations exceeded the NEPM (2013) Generic EIL criteria for commercial/industrial land use. All exceedances were within the fill material are conservative and not adjusted for the onsite conditions. In the context of the proposed development (warehouse) and the land of sensitive vegetation onsite these exceedances are not considered a significant concern.

ACM was only observed in one location during test pitting works (TP09 at 0.5 m BGL) but detected by the laboratory at three other locations (TP05 at 0.5 m BGL, TP14 at 0.1 m BGL and BH02 at 1.0 m BGL). One result (BH02_1.0) exceeded the NEPM (2013) criteria for AF/FA. While this sample is not considered a current risk to site users (being buried at 1.0 m below the surface) the presence of asbestos in fill on the site represents a potential risk to future site users, and in particular construction workers, if not managed appropriately.

Considering asbestos was detected at various locations across the site within approximately 20% of the samples analysed, there is a likelihood for more asbestos to be present within the fill material. WSP recommends that future intrusive works associated with the development of the site should be undertaken under the control of an asbestos management plan. WSP suggests that further investigation be undertaken to help characterize the nature and extent of asbestos in the fill profile. This will be used to inform any additional site specific asbestos controls, the extent of asbestos controls required or eventual remediation.

Five boreholes were advanced to a maximum depth of 10 m BGL to determine the geotechnical conditions at the site. Three boreholes were converted to groundwater monitoring wells to a maximum depth of 7 m BGL to determine the groundwater contamination status.

The elevated concentrations of heavy metals in the groundwater are potentially a result of naturally occurring conditions. However, detectible concentrations of cadmium, copper, nickel and zinc were identified in soil material throughout the site and may also be contributing to the observed groundwater concentrations. Further consideration of regional concentrations of heavy metals in soil and groundwater should be considered before determination of the site as a primary contamination source to groundwater. Some further analysis of deeper natural soils may assist in establishing natural metals concentrations.

It is important to note that there are no geotechnical conditions identified at this site that would constrain future development of the proposed warehouse facility, although design measures and ground treatments necessary to accommodate the site conditions will have a cost implication.

The investigation has confirmed that special engineered solutions as discussed in this report will be required to address the reactive clay soils which are prone to movement (shrink and swell) under seasonal changes in moisture content.

Warehouse footings should not be founded in the fill but rather taken down to natural soils or rock. Similarly, unsuitable material shall be removed from hardstand/pavement placement areas to aid in achieving a competent subgrade surface.

Considering the current contamination status of the site and the level of risk to potential on- or off-site receptors as determined by this ESA, there is currently no duty to report contamination to the EPA under the *Contaminated Land Management Act 1997*. This should be re-evaluated once the additional asbestos delineation testing has been completed.

11 REFERENCES

- ANZG (2018), Australian and New Zealand Guidelines for Fresh and Marine Water Quality
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- Safework Australia, *Excavation Work – Code of Practice*, dated October 2018.
- Safework NSW, *Code of Practice – Construction Work*, dated August 2019.
- Standards Australia, AS5100.3 – 2017: Bridge design, Part 3: Foundation and soil-supporting structures.

12 LIMITATIONS

This Report is provided by WSP Australia Pty Limited (*WSP*) for Concrete Estates Ltd c/o EMKC Pty Ltd (*Client*) in response to specific instructions from the Client and in accordance with WSP's proposal dated 20 January 2021 and agreement with the Client dated 27 January 2021 (*Agreement*).

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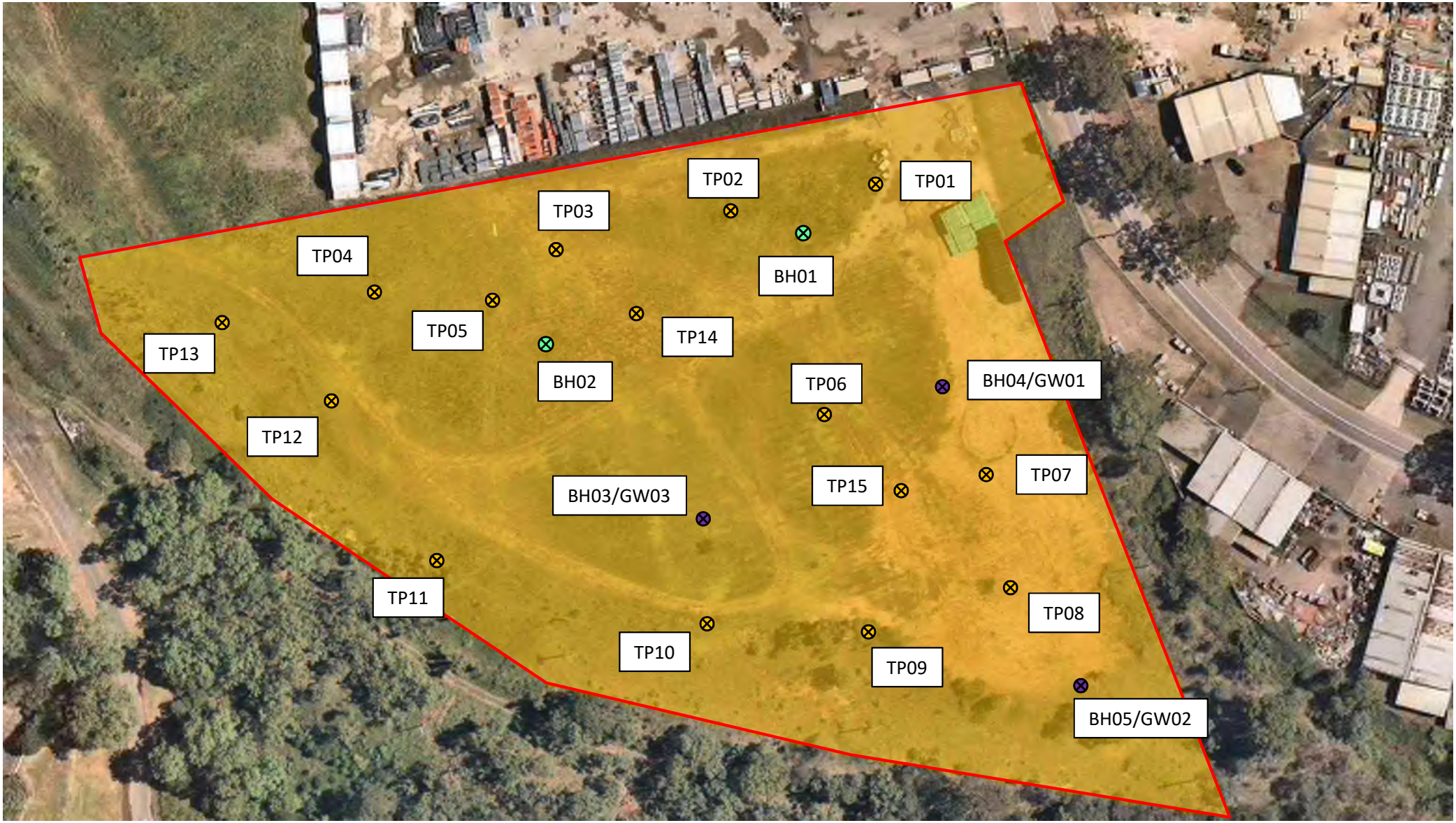
APPENDIX A

FIGURES

Source: SixMaps *(2021)*

Approximate Site boundary

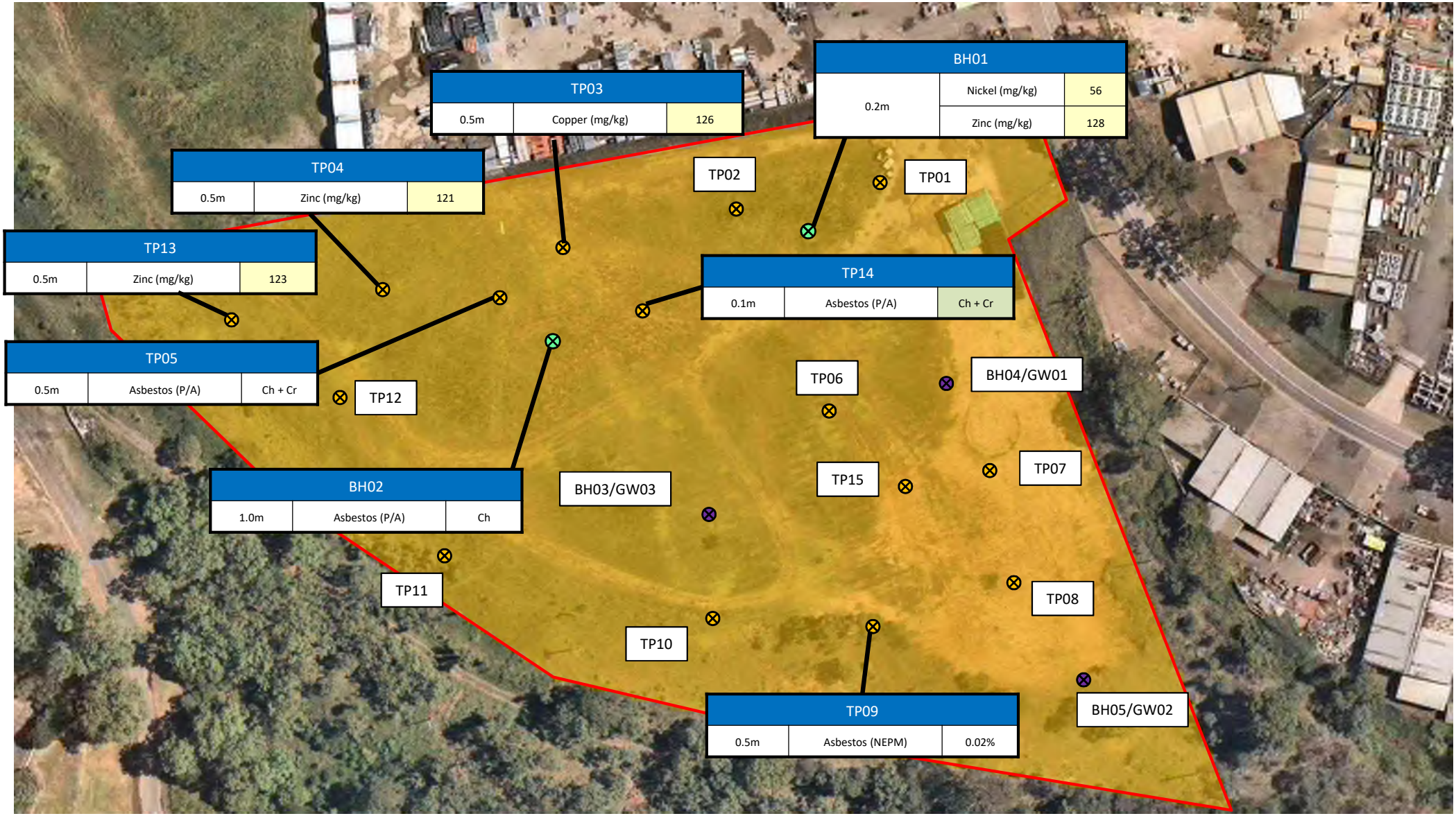
Figure 1 – Site location



- Test pit locations
- Groundwater well locations
- Borehole locations
- Approximate site boundary

Source: n*earmap (2021)*

Figure 2 – Intrusive investigation locations



Approximate site boundary

NEPM (2013) Table 1B(5) Generic EIL – Comm/Ind

NEPM (2013) HSLs Comm/Ind Asbestos

Source: n*earmap (2021)*

Figure 3 – Soil criteria exceedances

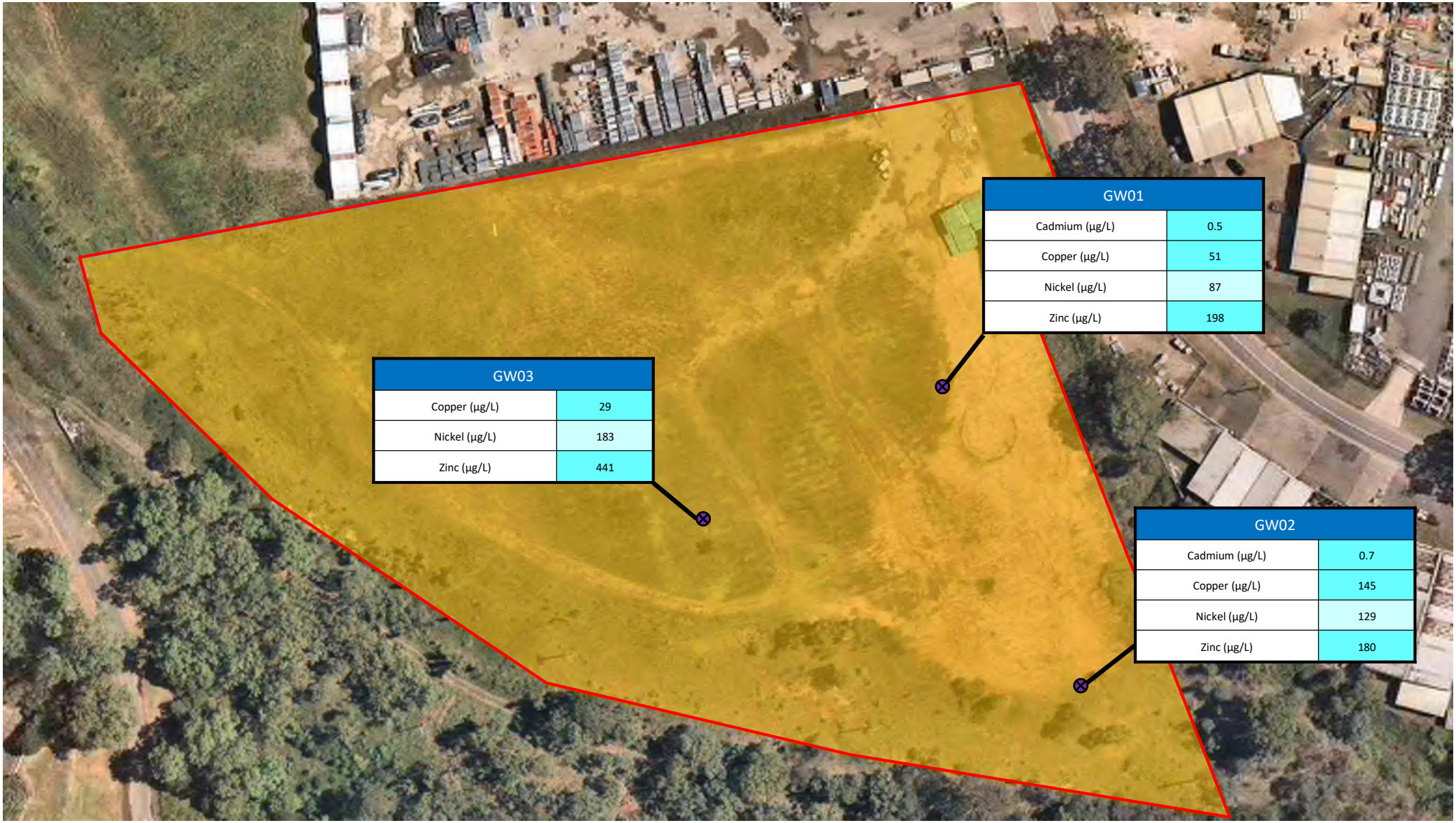
Source: n*earmap (2021)*

Approximate site boundary

23.0 Approx. groundwater contour (mAHD)

Approx. groundwater flow direction

Figure 4 – Inferred groundwater flow (Not based on survey data)



Approximate site boundary

ADWG (2011) - Health

ANZG (2018) Freshwater 95% toxicant DGVs

Source: n*earmap (2021)*

Figure 5 – Groundwater criteria exceedances

APPENDIX B

BOREHOLE, TEST PIT AND WELL LOGS

BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH01

SHEET : 1 OF 2

Client:	**EMKC**	Date Commenced:	**26/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**26/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**28 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 293053 N 6263930 MGA94 56**

Borehole Information							Field Material Description						
METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V	Nil	(NIL)	27.5	0.5					FILL: Sandy GRAVEL; dark grey, fine to coarse grained, sub-angular gravel, fine to medium grained sand, no odour	M			FILL
			27.5	0.5					FILL: Gravelly Silty CLAY; high plasticity, pale grey to brown, mottled red, fine to coarse grained, angular to sub-angular gravel, trace brick fragments, no odour	MC=PL to MC>PL			
			27.0	1.0	SPT 4, 7, 9 N=16	CBR SPT		CH	Silty CLAY; high plasticity, pale grey, heavily mottled red/orange, trace fine to coarse grained ironstone gravel	MC>PL		=250 =270 >600	RESIDUAL SOIL
			25.5	2.5	SPT 6, 9, 11 N=20	SPT		CL-CI	Silty CLAY; low to medium plasticity, pale grey, heavily mottled red/orange, trace fine to coarse grained ironstone gravel			=350 =450 =370	
			25.0	3.0				CI	Silty CLAY; medium plasticity, pale grey, heavily mottled red/orange, trace fine to coarse grained ironstone gravel			=300	
			24.0	4.0	SPT 9, 13, 15 N=28	SPT			4.1-4.3m: with ironstone bands, inferred very low strength 4.30-5.00m: trace fine grained sand			=390 =450 =350 =470	

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH01

SHEET : 2 OF 2

Client:	**EMKC**	Date Commenced:	**26/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**26/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**28 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 293053 N 6263930 MGA94 56**

Borehole Information							Field Material Description					
METHOD	SUPPORT	WATER	RL (m AHD) / DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V	Nil	(NIL) 26/02/21	5.00				CH	Gravelly Silty CLAY; high plasticity, pale grey to brown/red, medium to coarse grained, sub-angular to sub-rounded ironstone gravel	MC>PL		>600 >600 >600	RESIDUAL SOIL
			22.5 5.5	SPT 7, 30/145mm HB N=R	SPT							
			22.0 6.0 / 6.0					SHALE; grey to dark grey/brown, extremely weathered, inferred very low strength Recovered as Silty CLAY; high plasticity with fine to medium grained ironstone gravel	M to W			WEATHERED ROCK
			21.5 6.5									
			21.0					END OF BOREHOLE AT 6.90 m Refusal				
			20.5									
			20.0									
			19.5									
			19.0									
			18.5									

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH02

SHEET : 1 OF 3

Client:	**EMKC**	Date Commenced:	**25/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**25/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**25 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 292999 N 6263901 MGA94 56**

Borehole Information							Field Material Description						
METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V	Nil	(NIL)	24.5	0.5					FILL: Gravelly CLAY; grey to dark brown, high plasticity, fine to coarse grained, sub-angular to sub-rounded gravel, trace brick/tile fragments, no odour	MC=PL to MC>PL			FILL
			0.80					CH	Silty CLAY; high plasticity, pale grey, mottled red/orange, no odour	MC>PL		=270	RESIDUAL SOIL
			24.0	1.0									
			1.20		SPT 4, 20, 30 N=50			CI	Sandy CLAY; medium plasticity, pale grey, heavily mottled red/orange, fine grained sand, with fine to coarse grained, sub-angular to sub-rounded ironstone gravel			=210 >600 >600	
			23.5	1.5									
			23.0	*2.0*/2.0				CI-CH	Sandy Silty CLAY; medium to high plasticity, pale grey, mottled orange, fine grained sand				
			22.5	*2.5*/2.5	SPT 4, 6, 7 N=13	SPT		CI-CH	Silty CLAY; medium to high plasticity, pale grey, mottled orange, trace fine grained sand			=200 =210 =250	
			2.95									=270	
			22.0	3.0				CI-CH	Sandy Silty CLAY; medium to high plasticity, pale grey, mottled orange, fine grained sand				
			21.5	3.5									
			21.0	4.0	SPT 4, 8, 13 N=21	SPT			4.2-4.5m: trace fine to medium grained ironstone gravel			=190 =220 =270 =250	
			20.5	4.5									

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH02

SHEET : 2 OF 3

Client:	**EMKC**	Date Commenced:	**25/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**25/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**25 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 292999 N 6263901 MGA94 56**

Borehole Information						Field Material Description						
METHOD	SUPPORT	WATER	RL (m AHD) / DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V	Nil		5.00 19.5 5.5 5.60	SPT 22, 30/75mm HB N=R	SPT		CH	Silty CLAY; high plasticity, pale grey	MC>PL			RESIDUAL SOIL
			19.0 6.0 18.5 6.5 18.0 7.0	SPT 27, 30/75mm HB N=R	SPT			SHALE; brown to dark brown, dark grey, extremely weathered, inferred very low strength Recovered as Silty CLAY; high plasticity	M to W		>600 >600 >600 >600	WEATHERED ROCK
			17.5 7.5 17.0 8.0 16.5 8.5 16.0 9.0 15.5 9.5					REFER TO CORED BOREHOLE LOG				

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

CORED BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH02

SHEET : 3 OF 3

Client:	**EMKC**	Date Commenced:	**25/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**25/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**25 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 292999 N 6263901 MGA94 56**

Borehole Information							Field Material Description					
METHOD	SUPPORT	WATER	TOTAL CORE RECOVERY (TCR)	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	SOIL/ROCK MATERIAL FIELD DESCRIPTION	WEATHERING	INFERRED STRENGTH AND STRENGTH TEST MPa ($Is_{(50)}$/UCS) VL 0.1/2, L 0.3/6, M 1/20, H 3/60, VH 10/200, EH	AVERAGE DEFECT SPACING (mm) <20, 20-60, 60-200, 200-600, 600-2000, >2000	STRUCTURE AND ADDITIONAL OBSERVATIONS
					19.5	5.5						
					19.0	6.0						
					18.5	6.5						
					18.0	7.0						
					7.20			START CORING AT 7.20m				
HQ	C	100% Water RETURN	100	93	17.5	7.5		SHALE: pale grey to dark grey, orange staining, thinly to medium bedded, at 0-5°, with fine grained SANDSTONE (10%)	XW HW			7.62m: DB
					17.0	8.0						7.9m: Bg x6 (7.90-8.25m), 0°, Pl, Ro, Sn Fe
					8.20			LAMINITE: SANDSTONE (70%): fine grained, pale grey SILTSTONE (30%): grey to dark grey, thinly laminated to thinly bedded, at 0-5°	MW to SW			
					16.5	8.5						8.35m: Bg x5 (8.35-9.10m), 0°, Pl, Ro, Sn Fe
					16.0	9.0						9.12m: DB
								9.2-10.0m: Siltstone (70%), Sandstone (30%)	SW			9.4m: Bg, 0°, Pl, Ro, Cln
					15.5	9.5						9.65m: Bg, 0°, Pl, Ro, Cln
								END OF BOREHOLE AT 10.00 m Target depth				

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH03

SHEET : 1 OF 2

Client:	**EMKC**	Date Commenced:	**25/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**25/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**26 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 293008 N 6263860 MGA94 56**

Borehole Information							Field Material Description						
METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V	Nil	(NIL)	25.5	0.5					FILL: Clayey GRAVEL; dark brown, fine to coarse grained, sub-angular to sub-rounded gravel, medium plasticity clay, no odour	M			FILL
				0.20					FILL: Gravelly Silty CLAY; high plasticity, brown to dark brown/grey, fine to coarse grained, sub-angular gravel, trace brick/tile fragments, no odour	MC>PL			
				0.90				CH	Silty CLAY; high plasticity, pale grey, mottled red	MC>PL		=250 =300	RESIDUAL SOIL
			25.0	1.0	SPT 2, 6, 16 N=22	SPT		CI	Sandy Silty CLAY; medium plasticity, pale grey mottled pale orange, fine grained sand			>600 =450 =330	
				1.20									
			24.5	1.5									
			24.0	2.0		CBR							
				2.20				CI	Silty CLAY; medium plasticity, pale grey, mottled red-orange, with fine grained sand, trace fine grained ironstone gravel 2.30-2.35m: with Ironstone bands, red, inferred very low strength				
			23.5	2.5	SPT 5, 9, 11 N=20	SPT						=330 =350 =400 =370	
			23.0	3.0/3.0				CI-CH	Silty CLAY; medium to high plasticity, pale grey, mottled red-orange, with fine grained sand, trace fine grained ironstone gravel				
			22.5	3.5									
			22.0	4.0	SPT 5, 8, 10 N=18	SPT						=360 =370 =400 =270 =350	
			21.5	4.5									

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH03

SHEET : 2 OF 2

Client:	**EMKC**	Date Commenced:	**25/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**25/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**26 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 293008 N 6263860 MGA94 56**

Borehole Information							Field Material Description					
METHOD	SUPPORT	WATER	RL (m AHD) / DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V	Nil	25/02/21	5.00					SHALE; grey to brown, extremely weathered, inferred very low strength Recovered as Silty CLAY; medium to high plasticity	M to W			WEATHERED ROCK
			20.5 5.5	SPT 6, 15, 26 N=41	SPT						>600 >600 >600	
			20.0 6.0									
			19.5 6.5									
			19.0 7.0					END OF BOREHOLE AT 7.00 m Target depth				
			18.5									
			18.0									
			17.5									
			17.0									
			16.5									

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH04

SHEET : 1 OF 2

Client:	**EMKC**	Date Commenced:	**24/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**24/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**27 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 293086 N 6263894 MGA94 56**

Borehole Information							Field Material Description						
METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V	Nil	(NIL)	26.5	0.5					TOPSOIL: Clayey SILT; low plasticity, brown, trace roots, no odour	M			TOPSOIL
			26.3	0.20				CH	Silty CLAY; high plasticity, pale grey, heavily mottled red, trace fine grained ironstone gravel, no odour	MC>PL			RESIDUAL SOIL
			26.0	1.0	SPT 5, 8, 9 N=17	SPT						=350 =370 >600	
			25.5	1.5									
			25.0	2.0	SPT 3, 6, 8 N=14	SPT			2.0m: becoming pale grey, mottled orange 2.2-2.3m: trace roots/organic material, dark grey			=250 =280 =270 =220	
			24.5	2.5									
			24.0	3.0	SPT 4, 5, 9 N=14	SPT			3.3-3.5m: trace roots/organic material, dark grey			=280 =350 =300 =290	
			23.5	3.5									
			23.0	4.0	SPT 9, 13, 14 N=27	SPT			4.1-4.8m: becoming pale grey, heavily mottled red/orange, with fine grained ironstone gravel			=270 =360 =500 =370	
			22.5	4.5									
			22.2	4.80				CH	Gravelly CLAY; high plasticity, pale grey to dark red, mottled orange, fine grained, sub-angular ironstone gravel.				

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH04

Client:	**EMKC**	Date Commenced:	**24/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**24/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**27 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 293086 N 6263894 MGA94 56**

Borehole Information							Field Material Description					
METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V	Nil	24/02/21	21.5	5.5	SPT 30/145mm HB N=R	SPT		CH	Gravelly CLAY; high plasticity, pale grey to dark red, mottled orange, fine grained, sub-angular ironstone gravel.	MC>PL		=300 >600 =280 =320	RESIDUAL SOIL
				5.80									
			21.0	6.0	SPT 30/145mm HB N=R	SPT			SHALE; pale grey, extremely weathered, inferred very low strength Recovered as Silty CLAY; high plasticity	M to W		>600 >600 >600	WEATHERED ROCK
			20.5	6.5									
			20.0	7.0					END OF BOREHOLE AT 7.00 m Target depth				
			19.5										
			19.0										
			18.5										
			18.0										
			17.5										

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH05

SHEET : 1 OF 3

Client:	**EMKC**	Date Commenced:	**24/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**24/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**26 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 293107 N 6263816 MGA94 56**

Borehole Information							Field Material Description						
METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V	Nil	(NIL)	25.5	0.5					TOPSOIL: Clayey SILT; low plasticity, pale brown, trace roots, no odour	M			TOPSOIL
			25.80	0.20				CL	Silty CLAY; low plasticity, pale grey, heavily mottled red, with fine grained, sub-angular ironstone gravel, with fine grained sand, no odour	MC>PL			RESIDUAL SOIL
			25.0	1.0	SPT 8, 8, 11 N=19	SPT						>600	
												>600	
			24.5	1.5								>600	
			24.0	2.0	SPT 7, 11, 15 N=26	SPT						>600	
			23.5	2.5								>600	
			23.0	2.80				CL-CI	Sandy CLAY; low to medium plasticity, pale grey, mottled red/orange, fine grained sand, trace ironstone gravel, trace dark grey organic material/roots			>600	
				3.0	SPT 7, 7, 6 N=13	SPT						=170	
			22.5	3.5								=200	
												=150	
			22.0	4.0	SPT 4, 6, 7 N=13	SPT						=180	
			21.5	4.5								=170	
												=320	
												=250	
												=200	
												=190	

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH05

SHEET : 2 OF 3

Client:	**EMKC**	Date Commenced:	**24/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**24/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**26 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 293107 N 6263816 MGA94 56**

Borehole Information							Field Material Description						
METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V	Nil	(NIL)	20.5	5.5	SPT 13, 11, 18 N=29	SPT		CL-CI	Sandy CLAY; low to medium plasticity, pale grey, mottled red/orange, fine grained sand, trace ironstone gravel, trace dark grey organic material/roots	MC>PL		>600 >600	RESIDUAL SOIL
			5.30						SHALE; grey to dark grey, brown, extremely weathered, inferred very low strength Recovered as Silty CLAY; medium to high plasticity, interbedded with ironstone gravel	M		>600	WEATHERED ROCK
			20.0	6.0	SPT 6, 10, 19 N=29	SPT						>600 >600 >600	
			19.5	6.5									
			19.0	7.0	SPT 17, 20/80mm HB N=R	SPT						>600	
			18.5	7.5									
			18.0	8.0					REFER TO CORED BOREHOLE LOG				
			17.5	8.5									
			17.0	9.0									
			16.5	9.5									

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

CORED BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH05

SHEET : 3 OF 3

Client:	**EMKC**	Date Commenced:	**24/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**24/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**26 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 293107 N 6263816 MGA94 56**

Borehole Information							Field Material Description					
METHOD	SUPPORT	WATER	TOTAL CORE RECOVERY (TCR)	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	SOIL/ROCK MATERIAL FIELD DESCRIPTION	WEATHERING	INFERRED STRENGTH AND STRENGTH TEST MPa ($Is_{(50)}$/UCS) VL 0.1 / 2, L 0.3 / 6, M 1 / 20, H 3 / 60, VH 10 / 200, EH	AVERAGE DEFECT SPACING (mm) <20, 20-60, 60-200, 200-600, 600-2000, >2000	STRUCTURE AND ADDITIONAL OBSERVATIONS
					20.5	5.5						
					20.0	6.0						
					19.5	6.5						
					19.0	7.0						
					18.5	7.5						
					18.0	8.0		START CORING AT 8.00m				
HQ	C	100% Water RETURN	100	80	18.00	8.00		SHALE: grey to dark grey, red, with fine to medium grained ironstone, in a Silty CLAY matrix	XW			
					17.60	8.40		SILTSTONE: brown to pale grey, thinly bedded at 0°	HW to MW			8.63m: DB 8.64m: Bg, 0°, Pl, Ro, Cln 8.75m: DB
					17.5	8.5						
					17.10	8.90		LAMINITE: SANDSTONE (60%): fine grained, pale grey to brown, orange staining SILTSTONE (40%): grey to dark grey, thinly laminated to very thinly bedded, at 0-5°				8.9m: DB 8.95m: DB 9.01m: DB 9.06m: DB 9.1m: Jt, 90°, Pl, Ro, Sn Fe 9.12m: DB
					17.0	9.0						
					16.70	9.30		SILTSTONE: grey to dark grey, medium bedded at 0-5°, interbedded with fine grained SANDSTONE (10%)	SW to FR			9.5m: Bg, 0°, Pl, Ro, Cln 9.62m: DB
					16.5	9.5						9.77m: DB 9.8m: Bg, 0°, Pl, Ro, Cln 9.9m: DB
					16.00	10.00		END OF BOREHOLE AT 10.00 m Target depth				

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

TP01

SHEET 1 OF 1

Client:	**Concrete Estates Pty Ltd C/- EMKC**	Date Commenced:	**24-2-21**
Project:	**2/65 Dunheved Circuit, St Marys**	Date Completed:	**24-2-21**
Test Pit Location:	**North-eastern portion of site**	Recorded By:	**LBowe**
Project Number:	**PS123745**	Log Checked By:	**CM**
Excavation Method:		Surface RL:	
Excavation Width:	**400**	Co-ords:	

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST / FB VL L MD D VD H)	Field pH	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
N F G W O		PID=2.4 ppm	B			[FILL] Gravelly SAND; sandstone fill, m-c grained sand, brown/slightly orange, large sandstone gravels, dry	D			TP01_0.1
		PID=1.3 ppm	J			Anthropogenic inclusions (tiles, bricks, tape, plastic), dark black/brown sandy material				TP01_0.5
	-1									
	1.20					[NATURAL] Silty CLAY, red/brown, cohesive, dry				
		PID=1.2 ppm	J			Becoming more grey/red with depth				TP01_1.5
						TP Terminated - END OF TEST PIT AT 1.80 m				
	-2									
	-3									

TEST PIT ENVIRONMENTAL LOG

TEST PIT NO. TP02

SHEET 1 OF 1

Client:	**Concrete Estates Pty Ltd C/- EMKC**	Date Commenced:	**24-2-21**
Project:	**2/65 Dunheved Circuit, St Marys**	Date Completed:	**24-2-21**
Test Pit Location:	**Northern portion of site**	Recorded By:	**LBowe**
Project Number:	**PS123745**	Log Checked By:	**CM**
Excavation Method:		Surface RL:	
Excavation Width:	**400**	Co-ords:	

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST / FB VL L MD D VD H)	Field pH	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
N F G W O		PID=1.9 ppm	B			[FILL] Silty, clayey SAND, dark/brown, orange/grey clay lumps, some black gravels	D			TP02_0.1
	0.50	PID=1.3 ppm	J			[NATURAL] Sandy CLAY; grey/orange, l-m plasticity, soft, trace shale gravels				TP02_0.5
	-1	PID=1.2 ppm	J							TP02_1.0 + CBR test
						TP Terminated - END OF TEST PIT AT 1.10 m				
	-2									
	-3									

TEST PIT ENVIRONMENTAL LOG

TEST PIT NO. **TP03**

SHEET 1 OF 1

Client:	**Concrete Estates Pty Ltd C/- EMKC**	Date Commenced:	**24-2-21**
Project:	**2/65 Dunheved Circuit, St Marys**	Date Completed:	**24-2-21**
Test Pit Location:	**Northern portion of site**	Recorded By:	**LBowe**
Project Number:	**PS123745**	Log Checked By:	**CM**

Excavation Method:
Excavation Width: **400**
Surface RL:
Co-ords:

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST / FB VL L MD D VD H)	Field pH	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
N F G W O						[FILL] Clayey GRAVEL; brown clay, red/grey gravels, bricks	D			
						GRAVEL; dry, dark grey/black angular gravelsm no odour				
	0.40					[NATURAL] CLAY; some sand, red/grey mottles, trace shale gravels				
		PID=2.1 ppm	B&J							TP03_0.5
	-1					TP Terminated - END OF TEST PIT AT 1.00 m				
	-2									
	-3									

TEST PIT ENVIRONMENTAL LOG

TEST PIT NO. TP04

SHEET 1 OF 1

Client:	**Concrete Estates Pty Ltd C/- EMKC**	Date Commenced:	**24-2-21**
Project:	**2/65 Dunheved Circuit, St Marys**	Date Completed:	**24-2-21**
Test Pit Location:	**North-western portion of site**	Recorded By:	**LBowe**
Project Number:	**PS123745**	Log Checked By:	**CM**
Excavation Method:		Surface RL:	
Excavation Width:	**400**	Co-ords:	

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY: VS S F ST VST / FB VL L MD D VD H	Field pH	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
N F G W O		PID=3.2 ppm	B			[FILL] Sandy, gravelly CLAY; dark brown/dark grey, large angular gravels, anthropogenic inclusions (plastic, brick, pipe)	D			TP04_0.1
		PID=1.4 ppm	J							TP04_0.5
	-1									
						CLAY; with gravels, brown, highly plastic, soft, plastic material	M			
	-2									
	2.50	PID=1.2 ppm	J			[NATURAL] CLAY; black, soft				TP04_2.5
						CLAY; red, ironstone gravels, stiffer				
	-3					TP Terminated - END OF TEST PIT AT 3.00 m				

TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

TP05

SHEET 1 OF 1

Client:	**Concrete Estates Pty Ltd C/- EMKC**	Date Commenced:	**24-2-21**
Project:	**2/65 Dunheved Circuit, St Marys**	Date Completed:	**24-2-21**
Test Pit Location:	**North-central portion of site**	Recorded By:	**LBowe**
Project Number:	**PS123745**	Log Checked By:	**CM**
Excavation Method:		Surface RL:	
Excavation Width:	**400**	Co-ords:	

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST / FB VL L MD D VD H)	Field pH	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
N F G W O		PID=2.4 ppm	B&J			[FILL] Sandy, gravelly CLAY; brown, anthropogenic inclusions (bricks, pipes, glass/tiles)	D			TP05_0.5
	0.60	PID=1.3 ppm	B&J			[NATURAL] CLAY; soft, plastic, black, slightly moist	M			
	-1					CLAY; red, soft				TP05_1.0
						TP Terminated - END OF TEST PIT AT 1.00 m				
	-2									
	-3									

TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

TP06

SHEET 1 OF 1

Client:	**Concrete Estates Pty Ltd C/- EMKC**	Date Commenced:	**24-2-21**
Project:	**2/65 Dunheved Circuit, St Marys**	Date Completed:	**24-2-21**
Test Pit Location:	**Central portion of site**	Recorded By:	**LBowe**
Project Number:	**PS123745**	Log Checked By:	**CM**

Excavation Method:
Excavation Width: **400**

Surface RL:
Co-ords:

Test Pit Information | **Field Material Description**

1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST / FB VL L MD D VD H)	Field pH	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
N F G W O		PID=2.5 ppm	B			[FILL] Silty, sandy CLAY; brown, some small shale gravels, bricks/wires	D			TP06_0.1
	0.30	PID=1.5 ppm	J			[NATURAL] Gravelly CLAY; dark brown/grey with some orange, dry				TP06_0.5
	0.80	PID=1.4 ppm	J			CLAY; with SR-A shale gravels, red/grey mottled, soft, m-h plasticity				TP06_1.0
	-1					TP Terminated - END OF TEST PIT AT 1.00 m				
	-2									
	-3									

TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

TP07

SHEET 1 OF 1

Client:	**Concrete Estates Pty Ltd C/- EMKC**	Date Commenced:	**24-2-21**
Project:	**2/65 Dunheved Circuit, St Marys**	Date Completed:	**24-2-21**
Test Pit Location:	**Eastern portion of site**	Recorded By:	**LBowe**
Project Number:	**PS123745**	Log Checked By:	**CM**
Excavation Method:		Surface RL:	
Excavation Width:	**400**	Co-ords:	

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST / FB VL L MD D VD H)	Field pH	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
W	0.20					[FILL] Sandy CLAY; yellow/brown f-c grained sand, low plasticity clay	D			
O						[NATURAL] Silty CLAY; grey/red mottling, soft-moderately soft clay, m-h plasticity, dry, no odour				
		PID=5.3 ppm	B&J							TP07_0.5
						Becoming more grey				
		PID=4.1 ppm	B&J							TP07_1.0
	-1					TP Terminated - END OF TEST PIT AT 1.00 m				
	-2									
	-3									

TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

TP08

SHEET 1 OF 1

Client:	**Concrete Estates Pty Ltd C/- EMKC**	Date Commenced:	**24-2-21**
Project:	**2/65 Dunheved Circuit, St Marys**	Date Completed:	**24-2-21**
Test Pit Location:	**South-eastern portion of site**	Recorded By:	**LBowe**
Project Number:	**PS123745**	Log Checked By:	**CM**

Excavation Method:
Excavation Width: **400**

Surface RL:
Co-ords:

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST / FB VL L MD D VD H)	Field pH	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
N F G W O	0.20	PID=4.1 ppm	B&J			[FILL] Silty, clayey SAND; yellow/brown	D			TP08_0.2
		PID=2.1 ppm	J			[NATURAL] CLAY; red/brown, highly plastic, grey mottling, soft				TP08_0.5
	0.80					Silty CLAY; grey with red mottles, l-m plasticity, slightly harder				
	-1	PID=2.8 ppm	J							TP08_1.0
						SR-A red/orange shale gravels. Increase % of gravels with depth				
	-2					TP Terminated - END OF TEST PIT AT 2.00 m				
	-3									

TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

TP09

SHEET 1 OF 1

Client:	**Concrete Estates Pty Ltd C/- EMKC**	Date Commenced:	**24-2-21**
Project:	**2/65 Dunheved Circuit, St Marys**	Date Completed:	**24-2-21**
Test Pit Location:	**Southern portion of site**	Recorded By:	**LBowe**
Project Number:	**PS123745**	Log Checked By:	**CM**

Excavation Method:
Excavation Width: **400**

Surface RL:
Co-ords:

Test Pit Information | **Field Material Description**

1	2		3	4	5	6	7	8	9	10	11
WATER	RL(m)	DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY VS S F ST VST / FB VL L MD D VD H	Field pH	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
N F G W O			PID=1.4 ppm	B&J			[FILL] Silty, clayey SAND with gravels; anthropogenic inclusions (tiles, plastic, glass), PACM	D			TP09_0.5 QA01/QA01A NEPM Sieving and PACM sample
		0.60					[NATURAL] Silty CLAY; grey with red mottling, m-h plasticity Red with grey mottling, soft				
		-1	PID=1.4 ppm	B&J							TP09_1.0
							TP Terminated - END OF TEST PIT AT 1.20 m				
		-2									
		-3									

TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

TP10

SHEET 1 OF 1

Client:	**Concrete Estates Pty Ltd C/- EMKC**	Date Commenced:	**24-2-21**
Project:	**2/65 Dunheved Circuit, St Marys**	Date Completed:	**24-2-21**
Test Pit Location:	**Southern portion of site**	Recorded By:	**LBowe**
Project Number:	**PS123745**	Log Checked By:	**CM**

Excavation Method:
Excavation Width: **400**

Surface RL:
Co-ords:

Test Pit Information | **Field Material Description**

1	2		3	4	5	6	7	8	9	10	11
WATER	RL(m)	DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST / VL L MD D VD FB H)	Field pH	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
N F G W O			PID=2.2 ppm	B			[FILL] Sandy, gravelly CLAY; dark brown/grey with dark grey gravels	D			TP10_0.1
			PID=1.1 ppm	J							TP10_0.5
		0.60					[NATURAL] Sandy CLAY; m-c grained sand, soft, dark grey/brown				
		0.80					CLAY; moderately stiff, cohesive, m-h plasticity, red				
		-1									
			PID=1.4 ppm	B							California Bearing Ratio sample
		-2					TP Terminated - END OF TEST PIT AT 2.00 m				
		-3									

TEST PIT ENVIRONMENTAL LOG

TEST PIT NO. **TP11**

SHEET 1 OF 1

Client:	**Concrete Estates Pty Ltd C/- EMKC**	Date Commenced:	**24-2-21**
Project:	**2/65 Dunheved Circuit, St Marys**	Date Completed:	**24-2-21**
Test Pit Location:	**South-western portion of site**	Recorded By:	**LBowe**
Project Number:	**PS123745**	Log Checked By:	**CM**

Excavation Method:
Excavation Width: **400**

Surface RL:
Co-ords:

Test Pit Information | **Field Material Description**

1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST / FB VL L MD D VD H)	Field pH	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
N F G W O		PID=1.9 ppm	B			[FILL] Sandy, gravelly CLAY; dark brown with red/orange inclusions	D			TP11_0.1
		PID=1.2 ppm	J							TP11_0.5
	-1									
	1.50					[NATURAL] Sandy CLAY; m-c grained sand, soft, black				
	1.60					CLAY; red, moderately stiff, cohesive				
	-2					TP Terminated - END OF TEST PIT AT 2.00 m				
	-3									

TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

TP12

SHEET 1 OF 1

Client:	**Concrete Estates Pty Ltd C/- EMKC**	Date Commenced:	**24-2-21**
Project:	**2/65 Dunheved Circuit, St Marys**	Date Completed:	**24-2-21**
Test Pit Location:	**Western portion of site**	Recorded By:	**LBowe**
Project Number:	**PS123745**	Log Checked By:	**CM**

Excavation Method:
Excavation Width: **400**

Surface RL:
Co-ords:

Test Pit Information | **Field Material Description**

1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST / FB VL L MD D VD H)	Field pH	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
N F G W O		PID=1.2 ppm	B			[FILL] Sandy, gravelly CLAY; dark grey gravels, large boulder inclusions, bricks	D			TP12_0.1
		PID=1.1 ppm	J							TP12_0.5
	0.70					[NATURAL] CLAY; grey with yellow mottles, stiff, cohesive				
	-1	PID=1.1 ppm	J							TP12_1.0
						TP Terminated - END OF TEST PIT AT 1.20 m				
	-2									
	-3									

TEST PIT ENVIRONMENTAL LOG

TEST PIT NO. **TP13**

SHEET 1 OF 1

Client:	**Concrete Estates Pty Ltd C/- EMKC**	Date Commenced:	**24-2-21**
Project:	**2/65 Dunheved Circuit, St Marys**	Date Completed:	**24-2-21**
Test Pit Location:	**Western portion of site**	Recorded By:	**LBowe**
Project Number:	**PS123745**	Log Checked By:	**CM**
Excavation Method:		Surface RL:	
Excavation Width:	**400**	Co-ords:	

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST / FB VL L MD D VD H)	Field pH	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
N F G W O		PID=1.2 ppm	B			[FILL] Gravelly, sandy CLAY; dark brown, some lumps of grey/yellow clay, some sandstone cobbles, anthropogenic inclusions (bricks, pipes, metal, plastic, tiles, glass)	D			TP13_0.1
		PID=1.2 ppm	J							TP13_0.5
	-1									
	-2									
		PID=1.2 ppm	J							TP13_3.0
	-3					TP Terminated - END OF TEST PIT AT 3.00 m				

TEST PIT NO.

TEST PIT ENVIRONMENTAL LOG

TP14

SHEET 1 OF 1

Client:	**Concrete Estates Pty Ltd C/- EMKC**	Date Commenced:	**24-2-21**
Project:	**2/65 Dunheved Circuit, St Marys**	Date Completed:	**24-2-21**
Test Pit Location:	**Central portion of site**	Recorded By:	**LBowe**
Project Number:	**PS123745**	Log Checked By:	**CM**

Excavation Method:
Excavation Width: **400**

Surface RL:
Co-ords:

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST / FB VL L MD D VD H)	Field pH	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
N F G W O		PID=2.5 ppm	B			[FILL] Gravelly, clayey SILT, brown, dry, some bricks/black gravels	D			TP04_0.1
						Clayey GRAVEL; bricks and SR-A gravels, grey/black red/brown clay, soft				
	0.50	PID=1.4 ppm	J			[NATURAL] CLAY; moderately stiff, grey with red mottling, trace red/orange shale gravels				TP04_0.5
	-1					TP Terminated - END OF TEST PIT AT 1.00 m				
	-2									
	-3									

TEST PIT ENVIRONMENTAL LOG

TEST PIT NO.

TP15

SHEET 1 OF 1

Client:	**Concrete Estates Pty Ltd C/- EMKC**	Date Commenced:	**24-2-21**
Project:	**2/65 Dunheved Circuit, St Marys**	Date Completed:	**24-2-21**
Test Pit Location:	**Central portion of site**	Recorded By:	**LBowe**
Project Number:	**PS123745**	Log Checked By:	**CM**

Excavation Method:
Excavation Width: **400**

Surface RL:
Co-ords:

Test Pit Information				Field Material Description						
1	2	3	4	5	6	7	8	9	10	11
WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST / FB VL L MD D VD H)	Field pH	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
N F G W O		PID=2.3 ppm	B			[FILL] Silty, sandy CLAY; dark brown, grey/red clay lumps, some shale gravels	D			Compacted fill material, could be indicative of controlled fill TP15_0.1
						Silty CLAY; large grey gravels with orange/red mottles, not cohesive, dry				
	0.50	PID=1.4 ppm	J			[NATURAL] Silty GRAVEL; potential shale layer/boulder				TP15_0.5
	0.90					CLAY; red cohesive, high plasticity				
	-1	PID=1.5 ppm	J							TP15_1.0
						TP Terminated - END OF TEST PIT AT 1.20 m				
	-2									
	-3									

APPENDIX C

SOIL ANALYTICAL RESULTS

Table C1: Soil analytical results

	TRH					BTEX				PAH				Metals								OCP													
	C6 - C10	C10 - C16	C16 - C34	C34 - C40	C10 - C40 (Sum)	Benzene	Toluene	Ethylbenzene	Xylene (Sum)	Naphthalene	Benzo(a) pyrene	Benzo(a)pyrene TEQ calc (zero)	PAHs (Sum)	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	10	50	100	100	50	0.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	1	2	5	5	0.1	2	5	0.05	0.05	0.05	0.05	0.05	50	0.05	0.05	0.05	0.05	0.2	0.05
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind										370				160[#1]		310[#2]	85[#3]	1,800[#4]		55[#5]	110[#6]											640	
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil												40[#8]	4,000[#7]	3,000[#9]	900	3,600[#10]	240,000	1,500[#11]	730[#12]	6,000	400,000				45		530						3,600
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand																																	
0-1m						3	NL [#13]	NL [#13]	230	NL [#13]																									
1-2m						3	NL [#13]	NL [#13]	NL [#13]	NL [#13]																									
2-4m						3	NL [#13]	NL [#13]	NL [#13]	NL [#13]																									
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil (0-2m)		170	1,700	3,300		75	135	165	180		1.4																							
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil	700	1,000[#14]	3,500	10,000																													
CRC Care 2011 Table B4 Intrusive Maintenance Worker (Direct Contact)		62,000	85,000	120,000		1,100	120,000	85,000	130,000	29,000																								
Field ID	**Depth**	**Date**																																
BH01_0.2m	**0.2**	**24/02/2021**	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<1	42	79	102	<0.1	56	128	-	-	-	-	-	-	-	-	-	-	-	-
BH02_0.5	**0.5**	**24/02/2021**	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	9	<1	16	53	86	<0.1	22	103	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
BH03_0.5	**0.5**	**24/02/2021**	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	8	<1	15	19	24	<0.1	9	39	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
BH04_0.2	**0.2**	**24/02/2021**	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<1	8	10	8	<0.1	<2	6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
BH05_0.5	**0.5**	**24/02/2021**	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5	<1	11	10	8	<0.1	<2	17	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
TP01_0.5	**0.5**	**24/02/2021**	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<1	9	<5	8	<0.1	<2	17	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
TP02_1.0	**1**	**24/02/2021**	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<1	4	6	<5	<0.1	<2	5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
TP03_0.5	**0.5**	**24/02/2021**	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	7	<1	19	126	138	<0.1	19	98	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
TP04_0.5	**0.5**	**24/02/2021**	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	6	<1	13	38	115	0.7	7	161	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
TP05_1.0	**1**	**24/02/2021**	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	12	<1	21	64	229	0.1	5	47	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
TP06_0.5	**0.5**	**24/02/2021**	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5	<1	11	7	14	<0.1	2	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
TP07_0.5	**0.5**	**24/02/2021**	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	8	<1	12	14	13	<0.1	2	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
TP08_1.0	**1**	**24/02/2021**	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<1	7	7	6	<0.1	<2	7	-	-	-	-	-	-	-	-	-	-	-	-
TP09_0.5	**0.5**	**24/02/2021**	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	7	<1	11	12	36	<0.1	5	61	<0.05	<0.05	<0.05	0.99	<0.05	0.9	<0.05	0.09	<0.05	<0.05	<0.2	<0.05
TP11_0.5	**0.5**	**24/02/2021**	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	10	<1	18	21	26	<0.1	9	40	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
TP12_0.5	**0.5**	**24/02/2021**	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	8	<1	23	22	20	<0.1	15	43	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
TP13_0.5	**0.5**	**24/02/2021**	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	13	<1	20	13	53	<0.1	4	123	<0.05	<0.05	<0.05	0.27	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
TP14_0.5	**0.5**	**24/02/2021**	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	11	<1	15	20	21	<0.1	7	32	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
TP15_1.0	**1**	**24/02/2021**	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	8	<1	22	6	21	<0.1	2	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05

Comments

#1 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
#2 As Chromium III. Generic ACL value from NEPM 2013 Table 1B(3) using a clay content of 1%. The ACL should be adjusted based on site-specific Clay content (when available). To calculate a site specific EIL, add the ABC to the ACL.
#3 Generic ACL value from NEPM 2013 Table 1B(2) using a soil pH of 4.5. The ACL should be adjusted based on site-specific pH or CEC (when available). To calculate a site specific EIL, add the ABC to the ACL.
#4 Generic ACL value from NEPM 2013 Table 1B(4). To calculate a site specific EIL, add the added background concentration (ABC) to this value.
#5 Generic ACL value from NEPM 2013 Table 1B(3) using a CEC of 5 meq/100g. The ACL should be adjusted based on site-specific CEC (when available). To calculate a site specific EIL, add the added background concentration (ABC) to the ACL.
#6 Generic ACL value from NEPM 2013 Table 1B(1) using a soil pH of 4.0 and a CEC of 5 meq/100g. The ACL should be adjusted based on site-specific pH and CEC (when available). To calculate a site specific EIL, add the ABC to the ACL.
#7 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogenic PAHs (should meet BaP TEQ HIL) & naphthalene (should meet relevant HSL)
#8 Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (rel to BaP ref Schedule 7) BaP TEQ calc by multiplying the conc of each carc. PAH in sample by its BaP TEF (ref Table 1A(1)) & summing
#9 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Schedule B7).
#10 As Chromium VI
#11 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considered. Site-specific bioavailability should be considered where appropriate.
#12 Elemental mercury: HIL does not address elemental mercury. a site specific assessment should be considered if elemental mercury is present, or suspected to be present.
#13 Derived soil HSL exceeds soil saturation concentraiton

	OCP														OPP																			
	Dieldrin	Endosulfan	Endrin ketone	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	g.BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Azinophos methyl	Bromophos-ethyl	Carbophenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenamiphos	Fenthion	Malathion	Methyl parathion	Monocrotophos	Parathion	Pirimphos-ethyl	Prothiofos	
	mg/kg	mg/kg	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.05	50	50	0.05	0.05	0.05	0.05	50	0.05	0.05	0.05	0.05	0.2	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.2	0.2	0.2	0.05	0.05
NEPM 2013 Table 1B(5) Generic EIL - Comm/																																		
NEPM 2013 Table 1A(1) HILs Comm/Ind D So		2000					100			50		80	2,500					2,000																
NEPM 2013 Table 1A(3) Comm/Ind D Soil HS																																		
0-1m																																		
1-2m																																		
2-4m																																		
NEPM 2013 Table 1B(6) ESLs for Comm/Ind,																																		
NEPM 2013 Table 1B(7) Management Limits																																		
CRC Care 2011 Table B4 Intrusive Maintenan																																		
Field ID	**Depth**																																	
BH01_0.2m	**0.2**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02_0.5	**0.5**	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05
BH03_0.5	**0.5**	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05
BH04_0.2	**0.2**	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05
BH05_0.5	**0.5**	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05
TP01_0.5	**0.5**	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05
TP02_1.0	**1**	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05
TP03_0.5	**0.5**	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05
TP04_0.5	**0.5**	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05
TP05_1.0	**1**	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05
TP06_0.5	**0.5**	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05
TP07_0.5	**0.5**	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05
TP08_1.0	**1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP09_0.5	**0.5**	0.82	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05
TP11_0.5	**0.5**	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05
TP12_0.5	**0.5**	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05
TP13_0.5	**0.5**	0.27	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05
TP14_0.5	**0.5**	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05
TP15_1.0	**1**	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05

Comments
#1 Aged values apply to arsenic contaminati
#2 As Chromium III. Generic ACL value from N
#3 Generic ACL value from NEPM 2013 Table
#4 Generic ACL value from NEPM 2013 Table
#5 Generic ACL value from NEPM 2013 Table
#6 Generic ACL value from NEPM 2013 Table
#7 Total PAHs: Based on sum of 16 most com
#8 Carcinogenic PAHs: HIL based on 8 carc. P
#9 Arsenic: HIL assumes 70% oral bioavailabi
#10 As Chromium VI
#11 Lead: HILs A,B,C based on blood lead mo
#12 Elemental mercury: HIL does not addres
#13 Derived soil HSL exceeds soil saturation

	Field Observations		Laboratory Asbestos Identification				Laboratory Asbestos Quantification				
	Soil type	ACM observed in the field	Approximate Sample Weight	Asbestos detected (presence/absence)	Asbestos Type	ACM - Comment	Asbestos containing materail (as 15% Asbestos in ACM >7mm)	Asbestos fines and fibres (<7mm)	Asbestos fines and fibres (FA+AF)	Fibrous Asbestos >7mm	Asbestos Containig Matearil
	Comment	Yes/No	g	Yes/No	Comment	Comment	%	g	% (w/w)	g	g
EQL											
HSLs Comm/Ind D Asbestos							0.05		0.001		
Field ID **Date**											
BH02_1.0 **24/02/2021**	Fill - Clay	No	181	**Yes**	**Chrysotile**	Two pieces of asbestos fibre board approx. 15x10x3mm	0.02	0.0294	0.016	<0.0004	0.2
BH03_0.7 **24/02/2021**	Fill - Clay	No	131	No	-	-	-	-	-	-	-
BH04_0.5 **24/02/2021**	Fill - Clay	No	168	No	-	-	-	-	-	-	-
BH05_0.5 **24/02/2021**	Fill - Clay	No	193	No	-	-	-	-	-	-	-
TP01_0.1 **24/02/2021**	Fill - Sand	No	624	No	-	-	-	-	-	-	-
TP02_0.1 **24/02/2021**	Fill - Sand	No	422	No	-	-	-	-	-	-	-
TP04_0.1 **24/02/2021**	Fill - Clay	No	383	No	-	-	-	-	-	-	-
TP05_0.5 **24/02/2021**	Fill - Clay	No	474	**No***	**Chrysotile + Crocidolite**	One asbestos fibre bundle approx. 10x2x0.5mm	<0.01	0.001	<0.001	<0.0004	<0.1
TP06_0.1 **24/02/2021**	Fill - Clay	No	507	No	-	-	-	-	-	-	-
TP07_0.5 **24/02/2021**	Fill - Clay	No	305	No	-	-	-	-	-	-	-
TP08_0.2 **24/02/2021**	Fill - Sand	No	303	No	-	-	-	-	-	-	-
TP09_0.5 **24/02/2021**	Fill - Sand	**Yes**	556	**Yes**	**Chrysotile**	Several pieces of asbestos cement sheeting approx. 40x20x5mm	<0.01	<0.0004	<0.001	<0.0004	<0.1
TP10_0.1 **24/02/2021**	Fill - Clay	No	414	No	-	-	-	-	-	-	-
TP11_0.1 **24/02/2021**	Fill - Clay	No	429	No	-	-	-	-	-	-	-
TP12_0.1 **24/02/2021**	Fill - Clay	No	366	No	-	-	-	-	-	-	-
TP13_0.1 **24/02/2021**	Fill - Clay	No	413	No	-	-	-	-	-	-	-
TP14_0.1 **24/02/2021**	Fill - Silt	No	494	**No***	**Chrysotile + Crocidolite**	One piece of asbestos fibre board approx. 5x3x1mm	<0.01	0.004	<0.001	<0.0004	<0.1
TP15_0.1 **24/02/2021**	Fill - Clay	No	513	No	-	-	-	-	-	-	-

Notes:

No* No asbestos found at the reporting limit of 0.1g/kg. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1 g/kg

APPENDIX D

GROUNDWATER ANALYTICAL RESULTS AND GAUGING DATA

Well ID	Date gauged	Top of casing elevation (approximate)	Well depth	Depth to product	Product apparent thickness	Depth to groundwater	Approximate groundwater elevation	pH	Temperature	Electrical conductivity	Field redox	Standard hydrogen electrode redox	Dissolved oxygen	Comments
		(mAHD)	(m)	(mBTOC)	(m)	(mBTOC)	(mAHD)		(ºC)	(µS/cm)	(mV)	(mV)	(ppm)	
GW01	01-03-2021	26.90	7.692	-	-	2.557	24.343	5.94	24.6	31197.0	93.0	292.0	3.01	Slightly cloudy, colourless, no odours/sheens
GW02	01-03-2021	28.10	8.641	-	-	6.293	21.807	6.16	22.9	24234.0	60.4	259.4	2.72	Light brown, cloudy, no odours/sheens
GW03	01-03-2021	26.60	7.597	-	-	2.544	24.056	5.96	25.3	28904.0	48.8	247.8	4.06	Slightly cloudy, colourless, no odours/sheens

	TRH					BTEX						PAH									Metals					
	C6 - C10	C10 - C16	C16 - C34	C34 - C40	C10 - C40 (Sum)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene (Sum)	Anthracene	Benzo(a) pyrene	Benzo(b&j)fluoranthene	Benzo(k)fluoranthene	Fluoranthene	Naphthalene	Phenanthrene	PAHs (Sum)	Benzo(a)pyrene TEQ calc (Zero)	Arsenic (filtered)	Cadmium (filtered)	Chromium (filtered)	Copper (filtered)	Lead (filtered)	Mercury (filtered)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	20	100	100	100	100	1	2	2	2	2	2	1	0.5	1	1	1	1	1	0.5	0.5	1	0.1	1	1	1	0.1
ADWG 2011 (May 2019 Update) - Health						1	800	300			600		0.01								10	2		2,000	10	1
ANZG (2018) Freshwater 95% toxicant DGVs						950[#1]				350[#2]							16[#2]				24	0.2[#3]		1.4[#3]	3.4[#1]	0.6[#2]
NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Sand																										
2-4m						5,000	NL	NL			NL						NL									
4-8m						5,000	NL	NL			NL						NL									
>=8m						5,000	NL	NL			NL						NL									
NEPM 2013 Table 1C GILs, Fresh Waters						950				350							16					0.2[#5]		1.4[#5]	3.4[#5]	0.06[#6]
Field ID	**Date**																									
GW01	**1/03/2021**	<20	<100	120	<100	120	<1	<2	<2	<2	<2	<2	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5	1	0.5	<1	51	2	<0.1
GW02	**1/03/2021**	<20	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5	<1	0.7	<1	145	2	<0.1
GW03	**1/03/2021**	<20	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5	<1	0.2	<1	29	<1	<0.1

			OCP																							
	Nickel (filtered)	Zinc (filtered)	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endrin ketone	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	1	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2
ADWG 2011 (May 2019 Update) - Health	20					0.3		2					9									10	0.3			
ANZG (2018) Freshwater 95% toxicant DGVs	11[#2]	8[#4]						0.08[#1]					0.01[#1]							0.02[#1]		0.2[#1]	0.09[#1]			
NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Sand																										
2-4m																										
4-8m																										
>=8m																										
NEPM 2013 Table 1C GILs, Fresh Waters	11[#5]	8[#5]						0.03[#6]					0.006[#6]							0.01[#6]		0.2	0.01[#6]			
Field ID	**Date**																									
GW01	**1/03/2021**	87	198	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0
GW02	**1/03/2021**	129	180	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0
GW03	**1/03/2021**	183	441	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0

	OPP																		
	Azinophos methyl	Bromophos-ethyl	Carbophenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenamiphos	Fenthion	Malathion	Methyl parathion	Monocrotophos	Parathion	Pirimphos-ethyl	Prothiofos
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2	2	2	0.5	0.5
ADWG 2011 (May 2019 Update) - Health	30	10	0.5	2	10			4	5	7	4	0.5	7	70	0.7	2	20	0.5	
ANZG (2018) Freshwater 95% toxicant DGVs	0.02[#1]				0.01[#2]			0.01[#1]		0.15[#2]				0.05[#1]			0.004[#1]		
NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Sand																			
2-4m																			
4-8m																			
>=8m																			
NEPM 2013 Table 1C GILs, Fresh Waters					0.01[#6]			0.01		0.15				0.05			0.004[#7]		
Field ID	**Date**																		
GW01	**1/03/2021**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5
GW02	**1/03/2021**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5
GW03	**1/03/2021**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5

APPENDIX E

LABORATORY CERTIFICATES

WSP Australia P/L NSW
Level 27, Ernst & Young Centre
Sydney
NSW 2001

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Leila Bowe**

Report **777969-W**
Project name EMKC ST MARYS ESA
Project ID PS123745
Received Date Mar 03, 2021

Client Sample ID			**QA01A**
Sample Matrix			**Water**
Eurofins Sample No.			**S21-Ma07973**
Date Sampled			**Mar 01, 2021**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	0.4
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	0.4
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	85
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.01	mg/L	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	0.3
TRH >C34-C40	0.1	mg/L	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	0.3
Polycyclic Aromatic Hydrocarbons			
Acenaphthene	0.001	mg/L	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001
Anthracene	0.001	mg/L	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001
Chrysene	0.001	mg/L	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001
Fluoranthene	0.001	mg/L	< 0.001
Fluorene	0.001	mg/L	< 0.001

Client Sample ID			QA01A
Sample Matrix			Water
Eurofins Sample No.			S21-Ma07973
Date Sampled			Mar 01, 2021
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001
Naphthalene	0.001	mg/L	< 0.001
Phenanthrene	0.001	mg/L	< 0.001
Pyrene	0.001	mg/L	< 0.001
Total PAH*	0.001	mg/L	< 0.001
2-Fluorobiphenyl (surr.)	1	%	INT
p-Terphenyl-d14 (surr.)	1	%	96
Organochlorine Pesticides			
Chlordanes - Total	0.002	mg/L	< 0.002
4.4'-DDD	0.0001	mg/L	< 0.0001
4.4'-DDE	0.0001	mg/L	< 0.0001
4.4'-DDT	0.0001	mg/L	< 0.0001
a-BHC	0.0001	mg/L	< 0.0001
Aldrin	0.0001	mg/L	< 0.0001
b-BHC	0.0001	mg/L	< 0.0001
d-BHC	0.0001	mg/L	< 0.0001
Dieldrin	0.0001	mg/L	< 0.0001
Endosulfan I	0.0001	mg/L	0.0001
Endosulfan II	0.0001	mg/L	< 0.0001
Endosulfan sulphate	0.0001	mg/L	< 0.0001
Endrin	0.0001	mg/L	< 0.0001
Endrin aldehyde	0.0001	mg/L	< 0.0001
Endrin ketone	0.0001	mg/L	< 0.0001
g-BHC (Lindane)	0.0001	mg/L	< 0.0001
Heptachlor	0.0001	mg/L	< 0.0001
Heptachlor epoxide	0.0001	mg/L	< 0.0001
Hexachlorobenzene	0.0001	mg/L	< 0.0001
Methoxychlor	0.0002	mg/L	< 0.0002
Toxaphene	0.001	mg/L	< 0.001
Aldrin and Dieldrin (Total)*	0.0002	mg/L	< 0.0002
DDT + DDE + DDD (Total)*	0.0002	mg/L	< 0.0002
Vic EPA IWRG 621 OCP (Total)*	0.002	mg/L	< 0.002
Vic EPA IWRG 621 Other OCP (Total)*	0.002	mg/L	< 0.002
Dibutylchlorendate (surr.)	1	%	108
Tetrachloro-m-xylene (surr.)	1	%	149
Organophosphorus Pesticides			
Azinphos-methyl	0.002	mg/L	< 0.002
Bolstar	0.002	mg/L	< 0.002
Chlorfenvinphos	0.002	mg/L	< 0.002
Chlorpyrifos	0.02	mg/L	< 0.02
Chlorpyrifos-methyl	0.002	mg/L	< 0.002
Coumaphos	0.02	mg/L	< 0.02
Demeton-S	0.02	mg/L	< 0.02
Demeton-O	0.002	mg/L	< 0.002
Diazinon	0.002	mg/L	< 0.002
Dichlorvos	0.002	mg/L	< 0.002
Dimethoate	0.002	mg/L	< 0.002
Disulfoton	0.002	mg/L	< 0.002
EPN	0.002	mg/L	< 0.002

Client Sample ID			QA01A
Sample Matrix			Water
Eurofins Sample No.			S21-Ma07973
Date Sampled			Mar 01, 2021
Test/Reference	LOR	Unit	
Organophosphorus Pesticides			
Ethion	0.002	mg/L	< 0.002
Ethoprop	0.002	mg/L	< 0.002
Ethyl parathion	0.002	mg/L	< 0.002
Fenitrothion	0.002	mg/L	< 0.002
Fensulfothion	0.002	mg/L	< 0.002
Fenthion	0.002	mg/L	< 0.002
Malathion	0.002	mg/L	< 0.002
Merphos	0.002	mg/L	< 0.002
Methyl parathion	0.002	mg/L	< 0.002
Mevinphos	0.002	mg/L	< 0.002
Monocrotophos	0.002	mg/L	< 0.002
Naled	0.002	mg/L	< 0.002
Omethoate	0.002	mg/L	< 0.002
Phorate	0.002	mg/L	< 0.002
Pirimiphos-methyl	0.02	mg/L	< 0.02
Pyrazophos	0.002	mg/L	< 0.002
Ronnel	0.002	mg/L	< 0.002
Terbufos	0.002	mg/L	< 0.002
Tetrachlorvinphos	0.002	mg/L	< 0.002
Tokuthion	0.002	mg/L	< 0.002
Trichloronate	0.002	mg/L	< 0.002
Triphenylphosphate (surr.)	1	%	138
Heavy Metals			
Arsenic (filtered)	0.001	mg/L	0.002
Cadmium (filtered)	0.0002	mg/L	0.0002
Chromium (filtered)	0.001	mg/L	< 0.001
Copper (filtered)	0.001	mg/L	0.027
Lead (filtered)	0.001	mg/L	0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001
Nickel (filtered)	0.001	mg/L	0.17
Zinc (filtered)	0.005	mg/L	0.41

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Mar 03, 2021	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Mar 03, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Mar 03, 2021	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Mar 03, 2021	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Mar 03, 2021	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8 filtered	Sydney	Mar 03, 2021	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Organochlorine Pesticides	Sydney	Mar 03, 2021	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	Mar 03, 2021	7 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			

eurofins | Environment Testing

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Company Name: WSP Australia P/L NSW
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Sydney
NSW 2001

Project Name: EMKC ST MARYS ESA
Project ID: PS123745

Order No.:
Report #: 777969
Phone: 02 9272 5586
Fax: 02 9272 5101

Received: Mar 3, 2021 5:55 PM
Due: Mar 10, 2021
Priority: 5 Day
Contact Name: Leila Bowe

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Suite B14: OCP/OPP	Eurofins Suite B7 (filtered metals)
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
Mayfield Laboratory							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	QA01A	Mar 01, 2021		Water	S21-Ma07973	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/L	< 0.002			0.002	Pass	
4.4'-DDD	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDE	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDT	mg/L	< 0.0001			0.0001	Pass	
a-BHC	mg/L	< 0.0001			0.0001	Pass	
Aldrin	mg/L	< 0.0001			0.0001	Pass	
b-BHC	mg/L	< 0.0001			0.0001	Pass	
d-BHC	mg/L	< 0.0001			0.0001	Pass	
Dieldrin	mg/L	< 0.0001			0.0001	Pass	
Endosulfan I	mg/L	< 0.0001			0.0001	Pass	
Endosulfan II	mg/L	< 0.0001			0.0001	Pass	
Endosulfan sulphate	mg/L	< 0.0001			0.0001	Pass	
Endrin	mg/L	< 0.0001			0.0001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin aldehyde	mg/L	< 0.0001			0.0001	Pass	
Endrin ketone	mg/L	< 0.0001			0.0001	Pass	
g-BHC (Lindane)	mg/L	< 0.0001			0.0001	Pass	
Heptachlor	mg/L	< 0.0001			0.0001	Pass	
Heptachlor epoxide	mg/L	< 0.0001			0.0001	Pass	
Hexachlorobenzene	mg/L	< 0.0001			0.0001	Pass	
Methoxychlor	mg/L	< 0.0002			0.0002	Pass	
Toxaphene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/L	< 0.002			0.002	Pass	
Bolstar	mg/L	< 0.002			0.002	Pass	
Chlorfenvinphos	mg/L	< 0.002			0.002	Pass	
Chlorpyrifos	mg/L	< 0.02			0.02	Pass	
Chlorpyrifos-methyl	mg/L	< 0.002			0.002	Pass	
Coumaphos	mg/L	< 0.02			0.02	Pass	
Demeton-S	mg/L	< 0.02			0.02	Pass	
Demeton-O	mg/L	< 0.002			0.002	Pass	
Diazinon	mg/L	< 0.002			0.002	Pass	
Dichlorvos	mg/L	< 0.002			0.002	Pass	
Dimethoate	mg/L	< 0.002			0.002	Pass	
Disulfoton	mg/L	< 0.002			0.002	Pass	
EPN	mg/L	< 0.002			0.002	Pass	
Ethion	mg/L	< 0.002			0.002	Pass	
Ethoprop	mg/L	< 0.002			0.002	Pass	
Ethyl parathion	mg/L	< 0.002			0.002	Pass	
Fenitrothion	mg/L	< 0.002			0.002	Pass	
Fensulfothion	mg/L	< 0.002			0.002	Pass	
Fenthion	mg/L	< 0.002			0.002	Pass	
Malathion	mg/L	< 0.002			0.002	Pass	
Merphos	mg/L	< 0.002			0.002	Pass	
Methyl parathion	mg/L	< 0.002			0.002	Pass	
Mevinphos	mg/L	< 0.002			0.002	Pass	
Monocrotophos	mg/L	< 0.002			0.002	Pass	
Naled	mg/L	< 0.002			0.002	Pass	
Omethoate	mg/L	< 0.002			0.002	Pass	
Phorate	mg/L	< 0.002			0.002	Pass	
Pirimiphos-methyl	mg/L	< 0.02			0.02	Pass	
Pyrazophos	mg/L	< 0.002			0.002	Pass	
Ronnel	mg/L	< 0.002			0.002	Pass	
Terbufos	mg/L	< 0.002			0.002	Pass	
Tetrachlorvinphos	mg/L	< 0.002			0.002	Pass	
Tokuthion	mg/L	< 0.002			0.002	Pass	
Trichloronate	mg/L	< 0.002			0.002	Pass	
Method Blank							
Heavy Metals							
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	98			70-130	Pass	
TRH C10-C14	%	81			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	100			70-130	Pass	
Toluene	%	102			70-130	Pass	
Ethylbenzene	%	98			70-130	Pass	
m&p-Xylenes	%	98			70-130	Pass	
o-Xylene	%	100			70-130	Pass	
Xylenes - Total*	%	99			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	105			70-130	Pass	
TRH C6-C10	%	99			70-130	Pass	
TRH >C10-C16	%	84			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthylene	%	73			70-130	Pass	
Anthracene	%	88			70-130	Pass	
Benz(a)anthracene	%	80			70-130	Pass	
Benzo(b&j)fluoranthene	%	77			70-130	Pass	
Benzo(g.h.i)perylene	%	82			70-130	Pass	
Benzo(k)fluoranthene	%	78			70-130	Pass	
Chrysene	%	79			70-130	Pass	
Dibenz(a.h)anthracene	%	90			70-130	Pass	
Fluoranthene	%	81			70-130	Pass	
Fluorene	%	76			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	86			70-130	Pass	
Phenanthrene	%	88			70-130	Pass	
Pyrene	%	88			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	94			70-130	Pass	
4.4'-DDE	%	96			70-130	Pass	
4.4'-DDT	%	113			70-130	Pass	
a-BHC	%	89			70-130	Pass	
Aldrin	%	90			70-130	Pass	
b-BHC	%	91			70-130	Pass	
d-BHC	%	90			70-130	Pass	
Dieldrin	%	107			70-130	Pass	
Endosulfan I	%	105			70-130	Pass	
Endosulfan II	%	86			70-130	Pass	
Endosulfan sulphate	%	105			70-130	Pass	
Endrin	%	100			70-130	Pass	
Endrin aldehyde	%	106			70-130	Pass	
Endrin ketone	%	101			70-130	Pass	
g-BHC (Lindane)	%	90			70-130	Pass	
Heptachlor	%	104			70-130	Pass	
Heptachlor epoxide	%	96			70-130	Pass	
Hexachlorobenzene	%	97			70-130	Pass	
Methoxychlor	%	113			70-130	Pass	
LCS - % Recovery							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Organophosphorus Pesticides							
Diazinon	%	116			70-130	Pass	
Dimethoate	%	78			70-130	Pass	
Ethion	%	85			70-130	Pass	
Fenitrothion	%	105			70-130	Pass	
Methyl parathion	%	110			70-130	Pass	
Mevinphos	%	96			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic (filtered)	%	94			80-120	Pass	
Cadmium (filtered)	%	94			80-120	Pass	
Chromium (filtered)	%	92			80-120	Pass	
Copper (filtered)	%	91			80-120	Pass	
Lead (filtered)	%	94			80-120	Pass	
Mercury (filtered)	%	90			80-120	Pass	
Nickel (filtered)	%	92			80-120	Pass	
Zinc (filtered)	%	93			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S21-Ma11300	NCP	%	72			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S21-Ma11300	NCP	%	76			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	S21-Ma07973	CP	%	102			75-125	Pass	
Cadmium (filtered)	S21-Ma07973	CP	%	96			75-125	Pass	
Chromium (filtered)	S21-Ma07973	CP	%	93			75-125	Pass	
Copper (filtered)	S21-Ma07973	CP	%	85			75-125	Pass	
Lead (filtered)	S21-Ma07973	CP	%	93			75-125	Pass	
Mercury (filtered)	S21-Ma08391	NCP	%	88			75-125	Pass	
Nickel (filtered)	S21-Ma08391	NCP	%	89			75-125	Pass	
Zinc (filtered)	S21-Ma08391	NCP	%	88			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S21-Ma07918	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	S21-Ma08602	NCP	mg/L	0.85	0.89	5.0	30%	Pass	
TRH C15-C28	S21-Ma08602	NCP	mg/L	0.2	0.1	33	30%	Fail	Q15
TRH C29-C36	S21-Ma08602	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S21-Ma07918	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S21-Ma07918	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S21-Ma07918	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S21-Ma07918	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S21-Ma07918	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	S21-Ma07918	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S21-Ma07918	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	S21-Ma07918	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH >C10-C16	S21-Ma08602	NCP	mg/L	0.98	1.0	4.0	30%	Pass	
TRH >C16-C34	S21-Ma08602	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	S21-Ma08602	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	S21-Ma07445	NCP	mg/L	0.006	0.006	1.0	30%	Pass	
Cadmium (filtered)	S21-Ma07445	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	S21-Ma07445	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	S21-Ma07445	NCP	mg/L	0.004	0.004	<1	30%	Pass	
Lead (filtered)	S21-Ma07445	NCP	mg/L	0.003	0.003	1.0	30%	Pass	
Mercury (filtered)	S21-Ma07445	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	S21-Ma07445	NCP	mg/L	0.011	0.011	1.0	30%	Pass	
Zinc (filtered)	S21-Ma07445	NCP	mg/L	0.044	0.043	1.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Elvis Dsouza	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
John Nguyen	Senior Analyst-Metal (NSW)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

CERTIFICATE OF ANALYSIS

Work Order	: **ES2106968**	Page	: 1 of 37
Client	: **WSP Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: Leila Bowe	Contact	: Brenda Hong
Address	: ABN: 80 078 004 798 GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: PS123745 - EMKC ST MARYS ESA	Date Samples Received	: 25-Feb-2021 15:45
Order number	: ----	Date Analysis Commenced	: 02-Mar-2021
C-O-C number	: ----	Issue Date	: 05-Mar-2021 16:35
Sampler	: Leila Bowe		
Site	: ----		
Quote number	: EN/085/17		
No. of samples received	: 51		
No. of samples analysed	: 39		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Alana Smylie	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Alexander Ristoski	Laboratory Technican	Newcastle - Asbestos, Mayfield West, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

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

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

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

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

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

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

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for TEQ ero are treated as zero, for TEQ 1/2LOR are treated as half the reported LOR, and for TEQ LOR are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m p-Xylene and o-Xylene at or above the LOR.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- 4-Methylphenol at or above the LOR.
- EG005: Poor precision was obtained for Lead on sample ES2106968- 015. Results have been confirmed by re-extraction and reanalysis.
- EG005: Poor precision was obtained for Nickel on sample ES2106968- 050. Results have been confirmed by re-extraction and reanalysis.
- EG035: Positive Hg result ES2106968 12 has been confirmed by reanalysis.
- **EA200 Legend**
- EA200 Am Amosite (brown asbestos)
- EA200 Cr Crocidolite (blue asbestos)
- EA200 Ch Chrysotile (white asbestos)
- EA200: UMF Unknown Mineral Fibres. indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EP080: The trip spike and its control have been analysed for volatile TPH and BTEXN only. The trip spike and control were prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab and the control retained.
- EA200N: Asbestos weights and percentages are not covered under the Scope of NATA Accreditation.
  Weights of Asbestos are based on extracted bulk asbestos, fibre bundles, and/or ACM and do not include respirable fibres (if present)
  The Asbestos (Fines and Fibrous) weight is calculated from the extracted Fibrous Asbestos and Asbestos Fines as an equivalent weight of 100% Asbestos
  Percentages for Asbestos content in ACM are based on the 2013 NEPM default values.
  All calculations of percentage Asbestos under this method are approximate and should be used as a guide only.
- EA200 Trace Asbestos fibres (Free Fibres) detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable respirable asbestos fibres
- EA200N: ALS laboratory procedures and methods used for the identification and quantitation of asbestos are consistent with AS4964-2004 and the requirements of the 2013 NEPM for Assessment of Site Contamination

- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- EA200: Yes - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: No - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: No - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.
- EA200: N/A - Not Applicable

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP13_0.1	TP13_0.5	TP12_0.1	TP12_0.5	TP11_0.1
			Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
Compound	CAS Number	LOR	Unit	ES2106968-001	ES2106968-002	ES2106968-004	ES2106968-005	ES2106968-007
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	----	10.7	----	10.3	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	----	No	----	No
Asbestos Type	1332-21-4	-	--	-	----	-	----	-
Asbestos (Trace)	1332-21-4	5	Fibres	No	----	No	----	No
Sample weight (dry)	----	0.01	g	413	----	366	----	429
Synthetic Mineral Fibre	----	0.1	g/kg	No	----	No	----	No
Organic Fibre	----	0.1	g/kg	No	----	No	----	No
APPROVED IDENTIFIER:	----	-	--	A. SMYLIE	----	A. SMYLIE	----	A. SMYLIE
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	13	----	8	----
Cadmium	7440-43-9	1	mg/kg	----	<1	----	<1	----
Chromium	7440-47-3	2	mg/kg	----	20	----	23	----
Copper	7440-50-8	5	mg/kg	----	13	----	22	----
Lead	7439-92-1	5	mg/kg	----	53	----	20	----
Nickel	7440-02-0	2	mg/kg	----	4	----	15	----
Zinc	7440-66-6	5	mg/kg	----	123	----	43	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	<0.1	----	<0.1	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	<0.05	----	<0.05	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	<0.05	----	<0.05	----
beta-BHC	319-85-7	0.05	mg/kg	----	<0.05	----	<0.05	----
gamma-BHC	58-89-9	0.05	mg/kg	----	<0.05	----	<0.05	----
delta-BHC	319-86-8	0.05	mg/kg	----	<0.05	----	<0.05	----
Heptachlor	76-44-8	0.05	mg/kg	----	<0.05	----	<0.05	----
Aldrin	309-00-2	0.05	mg/kg	----	<0.05	----	<0.05	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	<0.05	----	<0.05	----
Total Chlordane (sum)	----	0.05	mg/kg	----	<0.05	----	<0.05	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	<0.05	----	<0.05	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	<0.05	----	<0.05	----
cis-Chlordane	5103-71-9	0.05	mg/kg	----	<0.05	----	<0.05	----
Dieldrin	60-57-1	0.05	mg/kg	----	0.27	----	<0.05	----
4.4`-DDE	72-55-9	0.05	mg/kg	----	<0.05	----	<0.05	----

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP13_0.1	TP13_0.5	TP12_0.1	TP12_0.5	TP11_0.1
				Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
Compound	CAS Number	LOR	Unit		ES2106968-001	ES2106968-002	ES2106968-004	ES2106968-005	ES2106968-007
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Endrin	72-20-8	0.05	mg/kg		----	<0.05	----	<0.05	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	<0.05	----	<0.05	----
Endosulfan (sum)	115-29-7	0.05	mg/kg		----	<0.05	----	<0.05	----
4.4`-DDD	72-54-8	0.05	mg/kg		----	<0.05	----	<0.05	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	<0.05	----	<0.05	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	<0.05	----	<0.05	----
4.4`-DDT	50-29-3	0.2	mg/kg		----	<0.2	----	<0.2	----
Endrin ketone	53494-70-5	0.05	mg/kg		----	<0.05	----	<0.05	----
Methoxychlor	72-43-5	0.2	mg/kg		----	<0.2	----	<0.2	----
Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		----	**0.27**	----	<0.05	----
Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		----	<0.05	----	<0.05	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		----	<0.05	----	<0.05	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		----	<0.05	----	<0.05	----
Monocrotophos	6923-22-4	0.2	mg/kg		----	<0.2	----	<0.2	----
Dimethoate	60-51-5	0.05	mg/kg		----	<0.05	----	<0.05	----
Diazinon	333-41-5	0.05	mg/kg		----	<0.05	----	<0.05	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		----	<0.05	----	<0.05	----
Parathion-methyl	298-00-0	0.2	mg/kg		----	<0.2	----	<0.2	----
Malathion	121-75-5	0.05	mg/kg		----	<0.05	----	<0.05	----
Fenthion	55-38-9	0.05	mg/kg		----	<0.05	----	<0.05	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		----	<0.05	----	<0.05	----
Parathion	56-38-2	0.2	mg/kg		----	<0.2	----	<0.2	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		----	<0.05	----	<0.05	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		----	<0.05	----	<0.05	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		----	<0.05	----	<0.05	----
Fenamiphos	22224-92-6	0.05	mg/kg		----	<0.05	----	<0.05	----
Prothiofos	34643-46-4	0.05	mg/kg		----	<0.05	----	<0.05	----
Ethion	563-12-2	0.05	mg/kg		----	<0.05	----	<0.05	----
Carbophenothion	786-19-6	0.05	mg/kg		----	<0.05	----	<0.05	----
Azinphos Methyl	86-50-0	0.05	mg/kg		----	<0.05	----	<0.05	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		----	<0.5	----	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg		----	<0.5	----	<0.5	----

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP13_0.1	TP13_0.5	TP12_0.1	TP12_0.5	TP11_0.1
			Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
Compound	CAS Number	LOR	Unit	ES2106968-001	ES2106968-002	ES2106968-004	ES2106968-005	ES2106968-007
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Acenaphthene	83-32-9	0.5	mg/kg	----	<0.5	----	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	----	<0.5	----	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	----	<0.5	----	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	----	<0.5	----	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	----	<0.5	----	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	----	<0.5	----	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	<0.5	----	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	----	<0.5	----	<0.5	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	<0.5	----	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	<0.5	----	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	<0.5	----	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	<0.5	----	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	<0.5	----	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	<0.5	----	<0.5	----
Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	<0.5	----	<0.5	----
Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	<0.5	----	<0.5	----
Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	**0.6**	----	**0.6**	----
Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	**1.2**	----	**1.2**	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	----	<10	----	<10	----
C10 - C14 Fraction	----	50	mg/kg	----	<50	----	<50	----
C15 - C28 Fraction	----	100	mg/kg	----	<100	----	<100	----
C29 - C36 Fraction	----	100	mg/kg	----	<100	----	<100	----
C10 - C36 Fraction (sum)	----	50	mg/kg	----	<50	----	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	<10	----	<10	----
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	<10	----	<10	----
>C10 - C16 Fraction	----	50	mg/kg	----	<50	----	<50	----
>C16 - C34 Fraction	----	100	mg/kg	----	<100	----	<100	----
>C34 - C40 Fraction	----	100	mg/kg	----	<100	----	<100	----
>C10 - C40 Fraction (sum)	----	50	mg/kg	----	<50	----	<50	----
>C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	<50	----	<50	----

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	TP13_0.1	TP13_0.5	TP12_0.1	TP12_0.5	TP11_0.1
				Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
					ES2106968-001	ES2106968-002	ES2106968-004	ES2106968-005	ES2106968-007
					Result	Result	Result	Result	Result
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		----	<0.2	----	<0.2	----
Toluene	108-88-3	0.5	mg/kg		----	<0.5	----	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg		----	<0.5	----	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		----	<0.5	----	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg		----	<0.5	----	<0.5	----
Sum of BTEX	----	0.2	mg/kg		----	<0.2	----	<0.2	----
Total Xylenes	----	0.5	mg/kg		----	<0.5	----	<0.5	----
Naphthalene	91-20-3	1	mg/kg		----	<1	----	<1	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	**84.4**	----	**75.5**	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	**108**	----	**99.7**	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	**91.8**	----	**82.5**	----
2-Chlorophenol-D4	93951-73-6	0.5	%		----	**83.6**	----	**82.0**	----
2.4.6-Tribromophenol	118-79-6	0.5	%		----	**86.4**	----	**83.8**	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	**105**	----	**104**	----
Anthracene-d10	1719-06-8	0.5	%		----	**89.7**	----	**98.7**	----
4-Terphenyl-d14	1718-51-0	0.5	%		----	**97.9**	----	**94.8**	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		----	**79.5**	----	**91.6**	----
Toluene-D8	2037-26-5	0.2	%		----	**84.3**	----	**90.3**	----
4-Bromofluorobenzene	460-00-4	0.2	%		----	**86.8**	----	**82.8**	----

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP11_0.5	TP10_0.1	TP04_0.1	TP04_0.5	TP05_0.5
			Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
Compound	CAS Number	LOR	Unit	ES2106968-008	ES2106968-009	ES2106968-011	ES2106968-012	ES2106968-014
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	16.9	----	----	14.4	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	No	No	----	No*
Asbestos Type	1332-21-4	-	--	----	-	-	----	Ch + Cr
Asbestos (Trace)	1332-21-4	5	Fibres	----	No	No	----	No
Sample weight (dry)	----	0.01	g	----	414	383	----	474
Synthetic Mineral Fibre	----	0.1	g/kg	----	No	No	----	No
Organic Fibre	----	0.1	g/kg	----	No	No	----	No
APPROVED IDENTIFIER:	----	-	--	----	A. SMYLIE	A. SMYLIE	----	A. SMYLIE
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	10	----	----	6	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	<1	----
Chromium	7440-47-3	2	mg/kg	18	----	----	13	----
Copper	7440-50-8	5	mg/kg	21	----	----	38	----
Lead	7439-92-1	5	mg/kg	26	----	----	115	----
Nickel	7440-02-0	2	mg/kg	9	----	----	7	----
Zinc	7440-66-6	5	mg/kg	40	----	----	161	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	0.7	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	<0.05	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	<0.05	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	<0.05	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	----	<0.05	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	----	<0.05	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	----	<0.05	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	----	<0.05	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	----	<0.05	----
Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	----	<0.05	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	----	<0.05	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	----	<0.05	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	----	<0.05	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	----	<0.05	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	----	----	<0.05	----

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP11_0.5	TP10_0.1	TP04_0.1	TP04_0.5	TP05_0.5
			Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
Compound	CAS Number	LOR	Unit	ES2106968-008	ES2106968-009	ES2106968-011	ES2106968-012	ES2106968-014
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Endrin	72-20-8	0.05	mg/kg	<0.05	----	----	<0.05	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	----	----	<0.05	----
Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	----	----	<0.05	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	----	----	<0.05	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	----	<0.05	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	----	<0.05	----
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	----	----	<0.2	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	----	<0.05	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	----	<0.2	----
Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	----	<0.05	----
Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	----	----	<0.05	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	----	----	<0.05	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	----	----	<0.05	----
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	----	----	<0.2	----
Dimethoate	60-51-5	0.05	mg/kg	<0.05	----	----	<0.05	----
Diazinon	333-41-5	0.05	mg/kg	<0.05	----	----	<0.05	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	----	----	<0.05	----
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	----	----	<0.2	----
Malathion	121-75-5	0.05	mg/kg	<0.05	----	----	<0.05	----
Fenthion	55-38-9	0.05	mg/kg	<0.05	----	----	<0.05	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	----	----	<0.05	----
Parathion	56-38-2	0.2	mg/kg	<0.2	----	----	<0.2	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	----	----	<0.05	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	----	----	<0.05	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	----	----	<0.05	----
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	----	----	<0.05	----
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	----	----	<0.05	----
Ethion	563-12-2	0.05	mg/kg	<0.05	----	----	<0.05	----
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	----	----	<0.05	----
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	----	----	<0.05	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	<0.5	----

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP11_0.5	TP10_0.1	TP04_0.1	TP04_0.5	TP05_0.5
			Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
Compound	CAS Number	LOR	Unit	ES2106968-008	ES2106968-009	ES2106968-011	ES2106968-012	ES2106968-014
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	----	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	<0.5	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	----	----	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	----	----	<0.5	----
Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	----	----	<0.5	----
Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	----	----	<0.5	----
Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	----	----	**0.6**	----
Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	----	----	**1.2**	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	<10	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	<50	----
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	<100	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	<100	----
C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	<10	----
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	----	<10	----
>C10 - C16 Fraction	----	50	mg/kg	<50	----	----	<50	----
>C16 - C34 Fraction	----	100	mg/kg	<100	----	----	<100	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	<100	----
>C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	<50	----
>C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	----	<50	----

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP11_0.5	TP10_0.1	TP04_0.1	TP04_0.5	TP05_0.5
				Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
Compound	CAS Number	LOR	Unit		ES2106968-008	ES2106968-009	ES2106968-011	ES2106968-012	ES2106968-014
					Result	Result	Result	Result	Result
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	<0.2	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	**0.6**	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	<0.5	----
Sum of BTEX	----	0.2	mg/kg		<0.2	----	----	**0.6**	----
Total Xylenes	----	0.5	mg/kg		<0.5	----	----	**0.6**	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	<1	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**83.1**	----	----	**78.7**	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**107**	----	----	**100**	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**84.5**	----	----	**91.3**	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**89.0**	----	----	**83.0**	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**86.8**	----	----	**80.3**	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**92.7**	----	----	**99.5**	----
Anthracene-d10	1719-06-8	0.5	%		**94.7**	----	----	**94.0**	----
4-Terphenyl-d14	1718-51-0	0.5	%		**99.1**	----	----	**91.9**	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**84.2**	----	----	**77.8**	----
Toluene-D8	2037-26-5	0.2	%		**81.9**	----	----	**92.8**	----
4-Bromofluorobenzene	460-00-4	0.2	%		**83.1**	----	----	**92.1**	----

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP05_1.0	TP03_0.5	TP14_0.1	TP14_0.5	TP02_0.1
			Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
Compound	CAS Number	LOR	Unit	ES2106968-015	ES2106968-016	ES2106968-017	ES2106968-018	ES2106968-019
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	14.1	15.8	----	16.5	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	No*	----	No
Asbestos Type	1332-21-4	-	--	----	----	Ch + Cr	----	-
Asbestos (Trace)	1332-21-4	5	Fibres	----	----	No	----	No
Sample weight (dry)	----	0.01	g	----	----	494	----	422
Synthetic Mineral Fibre	----	0.1	g/kg	----	----	No	----	No
Organic Fibre	----	0.1	g/kg	----	----	No	----	No
APPROVED IDENTIFIER:	----	-	--	----	----	A. SMYLIE	----	A. SMYLIE
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	12	7	----	11	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	<1	----
Chromium	7440-47-3	2	mg/kg	21	19	----	15	----
Copper	7440-50-8	5	mg/kg	64	126	----	20	----
Lead	7439-92-1	5	mg/kg	229	138	----	21	----
Nickel	7440-02-0	2	mg/kg	5	19	----	7	----
Zinc	7440-66-6	5	mg/kg	47	98	----	32	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.1	<0.1	----	<0.1	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	----	<0.05	----

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP05_1.0	TP03_0.5	TP14_0.1	TP14_0.5	TP02_0.1
				Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
Compound	CAS Number	LOR	Unit		ES2106968-015	ES2106968-016	ES2106968-017	ES2106968-018	ES2106968-019
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	----	<0.2	----
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	----	<0.2	----
Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	----	<0.2	----
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	----	<0.2	----
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	----	<0.2	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	----	<0.05	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	----	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	----	<0.5	----

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP05_1.0	TP03_0.5	TP14_0.1	TP14_0.5	TP02_0.1
			Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
Compound	CAS Number	LOR	Unit	ES2106968-015	ES2106968-016	ES2106968-017	ES2106968-018	ES2106968-019
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	**0.6**	----	**0.6**	----
Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	**1.2**	----	**1.2**	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	<10	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	<50	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	----	<100	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	----	<100	----
C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	----	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	----	<10	----
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	----	<10	----
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	----	<50	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	----	<100	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	<100	----
>C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	----	<50	----
>C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	----	<50	----

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	TP05_1.0	TP03_0.5	TP14_0.1	TP14_0.5	TP02_0.1
				Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
					ES2106968-015	ES2106968-016	ES2106968-017	ES2106968-018	ES2106968-019
					Result	Result	Result	Result	Result
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	----	<0.2	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	----	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	----	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	----	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	----	<0.5	----
Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	----	<0.2	----
Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	----	<0.5	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	----	<1	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**76.6**	**71.4**	----	**84.4**	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**101**	**95.1**	----	**112**	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**91.9**	**85.3**	----	**89.3**	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**82.5**	**87.5**	----	**90.0**	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**73.3**	**71.7**	----	**79.6**	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**99.4**	**100**	----	**104**	----
Anthracene-d10	1719-06-8	0.5	%		**90.3**	**93.8**	----	**85.9**	----
4-Terphenyl-d14	1718-51-0	0.5	%		**89.3**	**89.5**	----	**95.2**	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**82.9**	**86.3**	----	**90.1**	----
Toluene-D8	2037-26-5	0.2	%		**85.4**	**92.6**	----	**90.6**	----
4-Bromofluorobenzene	460-00-4	0.2	%		**87.8**	**93.0**	----	**89.0**	----

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP02_1.0	TP01_0.1	TP01_0.5	TP06_0..1	TP06_0.5
			Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
Compound	CAS Number	LOR	Unit	ES2106968-021	ES2106968-022	ES2106968-023	ES2106968-025	ES2106968-026
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	12.6	----	5.3	----	11.9
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	No	----	No	----
Asbestos Type	1332-21-4	-	--	----	-	----	-	----
Asbestos (Trace)	1332-21-4	5	Fibres	----	No	----	No	----
Sample weight (dry)	----	0.01	g	----	624	----	507	----
Synthetic Mineral Fibre	----	0.1	g/kg	----	No	----	No	----
Organic Fibre	----	0.1	g/kg	----	No	----	No	----
APPROVED IDENTIFIER:	----	-	--	----	A. SMYLIE	----	A. SMYLIE	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	----	<5	----	5
Cadmium	7440-43-9	1	mg/kg	<1	----	<1	----	<1
Chromium	7440-47-3	2	mg/kg	4	----	9	----	11
Copper	7440-50-8	5	mg/kg	6	----	<5	----	7
Lead	7439-92-1	5	mg/kg	<5	----	8	----	14
Nickel	7440-02-0	2	mg/kg	<2	----	<2	----	2
Zinc	7440-66-6	5	mg/kg	5	----	17	----	10
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	<0.1	----	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	----	<0.05	----	<0.05

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP02_1.0	TP01_0.1	TP01_0.5	TP06_0..1	TP06_0.5
			Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
Compound	CAS Number	LOR	Unit	ES2106968-021	ES2106968-022	ES2106968-023	ES2106968-025	ES2106968-026
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Endrin	72-20-8	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	----	<0.2	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	<0.2	----	<0.2
Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	----	<0.2	----	<0.2
Dimethoate	60-51-5	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Diazinon	333-41-5	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	----	<0.2	----	<0.2
Malathion	121-75-5	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Fenthion	55-38-9	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Parathion	56-38-2	0.2	mg/kg	<0.2	----	<0.2	----	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Ethion	563-12-2	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	<0.5	----	<0.5

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP02_1.0	TP01_0.1	TP01_0.5	TP06_0..1	TP06_0.5
			Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
Compound	CAS Number	LOR	Unit	ES2106968-021	ES2106968-022	ES2106968-023	ES2106968-025	ES2106968-026
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	----	**0.6**	----	**0.6**
Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	----	**1.2**	----	**1.2**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	<10	----	<10
C10 - C14 Fraction	----	50	mg/kg	<50	----	<50	----	<50
C15 - C28 Fraction	----	100	mg/kg	<100	----	<100	----	<100
C29 - C36 Fraction	----	100	mg/kg	<100	----	<100	----	<100
C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	<50	----	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	<10	----	<10
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	<10	----	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	----	<50	----	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	----	<100	----	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	----	<100	----	<100
>C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	<50	----	<50
>C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	<50	----	<50

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP02_1.0	TP01_0.1	TP01_0.5	TP06_0..1	TP06_0.5
				Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
Compound	CAS Number	LOR	Unit		ES2106968-021	ES2106968-022	ES2106968-023	ES2106968-025	ES2106968-026
					Result	Result	Result	Result	Result
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	<0.2	----	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Sum of BTEX	----	0.2	mg/kg		<0.2	----	<0.2	----	<0.2
Total Xylenes	----	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	----	<1	----	<1
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**74.6**	----	**86.4**	----	**74.0**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**130**	----	**110**	----	**95.1**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**86.2**	----	**88.8**	----	**88.3**
2-Chlorophenol-D4	93951-73-6	0.5	%		**89.2**	----	**87.4**	----	**85.0**
2.4.6-Tribromophenol	118-79-6	0.5	%		**77.0**	----	**73.7**	----	**73.3**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**104**	----	**103**	----	**99.2**
Anthracene-d10	1719-06-8	0.5	%		**94.7**	----	**92.1**	----	**93.7**
4-Terphenyl-d14	1718-51-0	0.5	%		**95.3**	----	**93.4**	----	**90.4**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**90.1**	----	**87.0**	----	**91.3**
Toluene-D8	2037-26-5	0.2	%		**92.8**	----	**85.2**	----	**102**
4-Bromofluorobenzene	460-00-4	0.2	%		**94.0**	----	**86.6**	----	**93.7**

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP15_0.1	TP15_1.0	TP09_0.5	TP08_0.2	TP08_1.0
			Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
Compound	CAS Number	LOR	Unit	ES2106968-028	ES2106968-030	ES2106968-031	ES2106968-034	ES2106968-036
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	----	4.2	14.7	----	12.0
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	----	No	No	----
Asbestos Type	1332-21-4	-	--	-	----	-	-	----
Asbestos (Trace)	1332-21-4	5	Fibres	No	----	No	No	----
Sample weight (dry)	----	0.01	g	513	----	556	303	----
Synthetic Mineral Fibre	----	0.1	g/kg	No	----	No	No	----
Organic Fibre	----	0.1	g/kg	No	----	No	No	----
APPROVED IDENTIFIER:	----	-	--	A. SMYLIE	----	A. SMYLIE	A. SMYLIE	----
EA200N: Asbestos Quantification (non-NATA)								
ø Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	----	----	<0.0004	----	----
ø Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	----	----	<0.001	----	----
ø Asbestos Containing Material	1332-21-4	0.1	g	----	----	<0.1	----	----
ø Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	% (w/w)	----	----	<0.01	----	----
ø Weight Used for % Calculation	----	0.0001	kg	----	----	0.556	----	----
ø Fibrous Asbestos >7mm	----	0.0004	g	----	----	<0.0004	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	8	7	----	<5
Cadmium	7440-43-9	1	mg/kg	----	<1	<1	----	<1
Chromium	7440-47-3	2	mg/kg	----	22	11	----	7
Copper	7440-50-8	5	mg/kg	----	6	12	----	7
Lead	7439-92-1	5	mg/kg	----	21	36	----	6
Nickel	7440-02-0	2	mg/kg	----	2	5	----	<2
Zinc	7440-66-6	5	mg/kg	----	10	50	----	7
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	<0.1	<0.1	----	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	<0.05	<0.05	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	<0.05	<0.05	----	----
beta-BHC	319-85-7	0.05	mg/kg	----	<0.05	<0.05	----	----
gamma-BHC	58-89-9	0.05	mg/kg	----	<0.05	<0.05	----	----
delta-BHC	319-86-8	0.05	mg/kg	----	<0.05	<0.05	----	----

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP15_0.1	TP15_1.0	TP09_0.5	TP08_0.2	TP08_1.0
			Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
Compound	CAS Number	LOR	Unit	ES2106968-028	ES2106968-030	ES2106968-031	ES2106968-034	ES2106968-036
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Heptachlor	76-44-8	0.05	mg/kg	----	<0.05	<0.05	----	----
Aldrin	309-00-2	0.05	mg/kg	----	<0.05	<0.05	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	<0.05	<0.05	----	----
Total Chlordane (sum)	----	0.05	mg/kg	----	<0.05	**0.09**	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	<0.05	**0.09**	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	<0.05	<0.05	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	----	<0.05	<0.05	----	----
Dieldrin	60-57-1	0.05	mg/kg	----	<0.05	**0.77**	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	----	<0.05	<0.05	----	----
Endrin	72-20-8	0.05	mg/kg	----	<0.05	<0.05	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	<0.05	<0.05	----	----
Endosulfan (sum)	115-29-7	0.05	mg/kg	----	<0.05	<0.05	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	----	<0.05	<0.05	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	<0.05	<0.05	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	<0.05	<0.05	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	----	<0.2	<0.2	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	<0.05	<0.05	----	----
Methoxychlor	72-43-5	0.2	mg/kg	----	<0.2	<0.2	----	----
Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	----	<0.05	**0.77**	----	----
Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-2	0.05	mg/kg	----	<0.05	<0.05	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	<0.05	<0.05	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	<0.05	<0.05	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	----	<0.2	<0.2	----	----
Dimethoate	60-51-5	0.05	mg/kg	----	<0.05	<0.05	----	----
Diazinon	333-41-5	0.05	mg/kg	----	<0.05	<0.05	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	<0.05	<0.05	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	----	<0.2	<0.2	----	----
Malathion	121-75-5	0.05	mg/kg	----	<0.05	<0.05	----	----
Fenthion	55-38-9	0.05	mg/kg	----	<0.05	<0.05	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	<0.05	<0.05	----	----
Parathion	56-38-2	0.2	mg/kg	----	<0.2	<0.2	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	<0.05	<0.05	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	<0.05	<0.05	----	----

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP15_0.1	TP15_1.0	TP09_0.5	TP08_0.2	TP08_1.0
			Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
Compound	CAS Number	LOR	Unit	ES2106968-028	ES2106968-030	ES2106968-031	ES2106968-034	ES2106968-036
				Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued								
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	<0.05	<0.05	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	----	<0.05	<0.05	----	----
Prothiofos	34643-46-4	0.05	mg/kg	----	<0.05	<0.05	----	----
Ethion	563-12-2	0.05	mg/kg	----	<0.05	<0.05	----	----
Carbophenothion	786-19-6	0.05	mg/kg	----	<0.05	<0.05	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	----	<0.05	<0.05	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
Fluorene	86-73-7	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
Anthracene	120-12-7	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
Pyrene	129-00-0	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
Chrysene	218-01-9	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	**0.6**	**0.6**	----	**0.6**
Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	**1.2**	**1.2**	----	**1.2**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	----	<10	<10	----	<10
C10 - C14 Fraction	----	50	mg/kg	----	<50	<50	----	<50
C15 - C28 Fraction	----	100	mg/kg	----	<100	<100	----	<100
C29 - C36 Fraction	----	100	mg/kg	----	<100	<100	----	<100
C10 - C36 Fraction (sum)	----	50	mg/kg	----	<50	<50	----	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	TP15_0.1	TP15_1.0	TP09_0.5	TP08_0.2	TP08_1.0
				Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
					ES2106968-028	ES2106968-030	ES2106968-031	ES2106968-034	ES2106968-036
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
C6 - C10 Fraction	C6_C10	10	mg/kg		----	<10	<10	----	<10
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		----	<10	<10	----	<10
>C10 - C16 Fraction	----	50	mg/kg		----	<50	<50	----	<50
>C16 - C34 Fraction	----	100	mg/kg		----	<100	<100	----	<100
>C34 - C40 Fraction	----	100	mg/kg		----	<100	<100	----	<100
>C10 - C40 Fraction (sum)	----	50	mg/kg		----	<50	<50	----	<50
>C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		----	<50	<50	----	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		----	<0.2	<0.2	----	<0.2
Toluene	108-88-3	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Sum of BTEX	----	0.2	mg/kg		----	<0.2	<0.2	----	<0.2
Total Xylenes	----	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Naphthalene	91-20-3	1	mg/kg		----	<1	<1	----	<1
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	**75.6**	**78.8**	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	**98.6**	**103**	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	**87.4**	**88.6**	----	**85.8**
2-Chlorophenol-D4	93951-73-6	0.5	%		----	**86.6**	**83.5**	----	**82.7**
2.4.6-Tribromophenol	118-79-6	0.5	%		----	**76.3**	**69.6**	----	**69.2**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	**104**	**101**	----	**101**
Anthracene-d10	1719-06-8	0.5	%		----	**105**	**98.2**	----	**97.4**
4-Terphenyl-d14	1718-51-0	0.5	%		----	**95.6**	**91.0**	----	**89.9**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		----	**88.4**	**87.1**	----	**82.6**
Toluene-D8	2037-26-5	0.2	%		----	**89.2**	**90.3**	----	**82.5**
4-Bromofluorobenzene	460-00-4	0.2	%		----	**88.2**	**81.2**	----	**86.7**

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP07_0.5	QA01	TRIP BLABK	TRIP SPIKE	BH03_0.7
			Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	22-Feb-2021 00:00	25-Feb-2021 00:00
Compound	CAS Number	LOR	Unit	ES2106968-037	ES2106968-039	ES2106968-040	ES2106968-041	ES2106968-042
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	10.6	13.6	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	----	----	----	No
Asbestos Type	1332-21-4	-	--	-	----	----	----	-
Asbestos (Trace)	1332-21-4	5	Fibres	No	----	----	----	No
Sample weight (dry)	----	0.01	g	305	----	----	----	131
Synthetic Mineral Fibre	----	0.1	g/kg	No	----	----	----	No
Organic Fibre	----	0.1	g/kg	No	----	----	----	No
APPROVED IDENTIFIER:	----	-	--	A. SMYLIE	----	----	----	A. SMYLIE
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	8	6	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	12	9	----	----	----
Copper	7440-50-8	5	mg/kg	14	9	----	----	----
Lead	7439-92-1	5	mg/kg	13	32	----	----	----
Nickel	7440-02-0	2	mg/kg	2	4	----	----	----
Zinc	7440-66-6	5	mg/kg	10	61	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	----	----	----
Total Chlordane (sum)	----	0.05	mg/kg	<0.05	0.07	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.07	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.82	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	----	----	----

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP07_0.5	QA01	TRIP BLABK	TRIP SPIKE	BH03_0.7
			Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	22-Feb-2021 00:00	25-Feb-2021 00:00
Compound	CAS Number	LOR	Unit	ES2106968-037	ES2106968-039	ES2106968-040	ES2106968-041	ES2106968-042
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	----	----	----
Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	**0.82**	----	----	----
Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	<0.05	----	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	----	----	----
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	----	----	----
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	----	----	----
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	----	----	----
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	----	----	----
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	----	----	----
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	----	----

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	TP07_0.5	QA01	TRIP BLABK	TRIP SPIKE	BH03_0.7
				Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	22-Feb-2021 00:00	25-Feb-2021 00:00
					ES2106968-037	ES2106968-039	ES2106968-040	ES2106968-041	ES2106968-042
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	----	----	----
Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	----	----	----
Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	----	----	----
Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	**0.6**	----	----	----
Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	**1.2**	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	**57**	----
C10 - C14 Fraction	----	50	mg/kg		<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	----	----	----
C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	**70**	----
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	**32**	----
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	----	----	----
>C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	----	----	----
>C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	----	----	----

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP07_0.5	QA01	TRIP BLABK	TRIP SPIKE	BH03_0.7
			Sampling date / time	24-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	22-Feb-2021 00:00	25-Feb-2021 00:00
Compound	CAS Number	LOR	Unit	ES2106968-037	ES2106968-039	ES2106968-040	ES2106968-041	ES2106968-042
				Result	Result	Result	Result	Result
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	**15.7**	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	**2.7**	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	**13.8**	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	**5.8**	----
Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	**38.0**	----
Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	**19.6**	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**78.0**	**70.0**	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**100.0**	**82.3**	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**91.4**	**81.7**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**88.1**	**85.5**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**62.8**	**65.6**	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**100**	**102**	----	----	----
Anthracene-d10	1719-06-8	0.5	%	**96.8**	**93.5**	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	**91.0**	**91.8**	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**86.2**	**84.2**	**87.5**	**96.8**	----
Toluene-D8	2037-26-5	0.2	%	**85.2**	**83.4**	**89.0**	**112**	----
4-Bromofluorobenzene	460-00-4	0.2	%	**86.9**	**83.8**	**92.7**	**109**	----

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH02_0.5	BH03_0.5	BH02_1.0	BH04/GW01_0.5	BH04_0.2
			Sampling date / time	25-Feb-2021 00:00	25-Feb-2021 00:00	25-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
Compound	CAS Number	LOR	Unit	ES2106968-043	ES2106968-044	ES2106968-045	ES2106968-046	ES2106968-047
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	13.3	15.7	----	----	12.7
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	Yes	No	----
Asbestos Type	1332-21-4	-	--	----	----	Ch	-	----
Asbestos (Trace)	1332-21-4	5	Fibres	----	----	No	No	----
Sample weight (dry)	----	0.01	g	----	----	181	168	----
Synthetic Mineral Fibre	----	0.1	g/kg	----	----	No	No	----
Organic Fibre	----	0.1	g/kg	----	----	No	No	----
APPROVED IDENTIFIER:	----	-	--	----	----	A. SMYLIE	A. SMYLIE	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	9	8	----	----	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	<1
Chromium	7440-47-3	2	mg/kg	16	15	----	----	8
Copper	7440-50-8	5	mg/kg	53	19	----	----	10
Lead	7439-92-1	5	mg/kg	86	24	----	----	8
Nickel	7440-02-0	2	mg/kg	22	9	----	----	<2
Zinc	7440-66-6	5	mg/kg	103	39	----	----	6
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	----	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	----	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	----	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	----	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	----	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	----	----	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	----	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	----	----	<0.05
Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	----	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	----	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	----	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	----	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	----	----	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	----	----	<0.05

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	BH02_0.5	BH03_0.5	BH02_1.0	BH04/GW01_0.5	BH04_0.2
				Sampling date / time	25-Feb-2021 00:00	25-Feb-2021 00:00	25-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
					ES2106968-043	ES2106968-044	ES2106968-045	ES2106968-046	ES2106968-047
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	----	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	----	----	<0.2
Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	----	----	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	----	----	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	----	----	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	----	----	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	----	----	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	----	----	<0.5

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH02_0.5	BH03_0.5	BH02_1.0	BH04/GW01_0.5	BH04_0.2
			Sampling date / time	25-Feb-2021 00:00	25-Feb-2021 00:00	25-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
Compound	CAS Number	LOR	Unit	ES2106968-043	ES2106968-044	ES2106968-045	ES2106968-046	ES2106968-047
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	**0.6**	----	----	**0.6**
Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	**1.2**	----	----	**1.2**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	----	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	----	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	----	----	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	----	----	<100
C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	----	----	<10
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	----	----	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	----	----	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	----	----	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	----	<100
>C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	<50
>C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	----	----	<50

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	BH02_0.5	BH03_0.5	BH02_1.0	BH04/GW01_0.5	BH04_0.2
				Sampling date / time	25-Feb-2021 00:00	25-Feb-2021 00:00	25-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00
					ES2106968-043	ES2106968-044	ES2106968-045	ES2106968-046	ES2106968-047
					Result	Result	Result	Result	Result
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	----	----	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	----	----	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	----	----	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	----	----	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	----	----	<0.5
Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	----	----	<0.2
Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	----	----	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	----	----	<1
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**79.2**	**73.0**	----	----	**73.1**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**105**	**95.3**	----	----	**91.6**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**88.1**	**80.0**	----	----	**81.1**
2-Chlorophenol-D4	93951-73-6	0.5	%		**89.2**	**84.8**	----	----	**83.5**
2.4.6-Tribromophenol	118-79-6	0.5	%		**69.2**	**68.5**	----	----	**68.2**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**104**	**103**	----	----	**101**
Anthracene-d10	1719-06-8	0.5	%		**101**	**103**	----	----	**87.5**
4-Terphenyl-d14	1718-51-0	0.5	%		**94.6**	**92.6**	----	----	**92.6**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**88.6**	**76.9**	----	----	**88.9**
Toluene-D8	2037-26-5	0.2	%		**92.1**	**88.2**	----	----	**95.9**
4-Bromofluorobenzene	460-00-4	0.2	%		**88.5**	**92.0**	----	----	**91.9**

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH05_0.5	TSC	BH01_0.2m	----	----
			Sampling date / time	24-Feb-2021 00:00	22-Feb-2021 00:00	26-Feb-2021 00:00	----	----
Compound	CAS Number	LOR	Unit	ES2106968-048	ES2106968-049	ES2106968-050	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**18.1**	----	**12.7**	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	----	----	----	----
Asbestos Type	1332-21-4	-	--	**-**	----	----	----	----
Asbestos (Trace)	1332-21-4	5	Fibres	**No**	----	----	----	----
Sample weight (dry)	----	0.01	g	**193**	----	----	----	----
Synthetic Mineral Fibre	----	0.1	g/kg	**No**	----	----	----	----
Organic Fibre	----	0.1	g/kg	**No**	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	**A. SMYLIE**	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**5**	----	<5	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	<1	----	----
Chromium	7440-47-3	2	mg/kg	**11**	----	**42**	----	----
Copper	7440-50-8	5	mg/kg	**10**	----	**79**	----	----
Lead	7439-92-1	5	mg/kg	**8**	----	**102**	----	----
Nickel	7440-02-0	2	mg/kg	<2	----	**56**	----	----
Zinc	7440-66-6	5	mg/kg	**17**	----	**128**	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	<0.1	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	----	----	----
Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	----	----	----	----

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH05_0.5	TSC	BH01_0.2m	----	----
				Sampling date / time	24-Feb-2021 00:00	22-Feb-2021 00:00	26-Feb-2021 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2106968-048	ES2106968-049	ES2106968-050	--------	--------
					Result	Result	Result	----	----
EP068A: Organochlorine Pesticides (OC) - Continued									
Endrin	72-20-8	0.05	mg/kg		<0.05	----	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	----	----	----	----
Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	----	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	----	----	----	----
Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	----	----	----	----
Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	----	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	----	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	----	----	----	----
Dimethoate	60-51-5	0.05	mg/kg		<0.05	----	----	----	----
Diazinon	333-41-5	0.05	mg/kg		<0.05	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	----	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	----	----	----	----
Malathion	121-75-5	0.05	mg/kg		<0.05	----	----	----	----
Fenthion	55-38-9	0.05	mg/kg		<0.05	----	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	----	----	----	----
Parathion	56-38-2	0.2	mg/kg		<0.2	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	----	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	----	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	----	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	----	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	----	----	----	----
Ethion	563-12-2	0.05	mg/kg		<0.05	----	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	----	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	<0.5	----	----

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH05_0.5	TSC	BH01_0.2m	----	----
			Sampling date / time	24-Feb-2021 00:00	22-Feb-2021 00:00	26-Feb-2021 00:00	----	----
Compound	CAS Number	LOR	Unit	ES2106968-048	ES2106968-049	ES2106968-050	--------	--------
				Result	Result	Result	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	<0.5	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	<0.5	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	<0.5	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	<0.5	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	----	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	<0.5	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	<0.5	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	----	<0.5	----	----
Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	----	<0.5	----	----
Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	----	<0.5	----	----
Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	----	**0.6**	----	----
Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	----	**1.2**	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	**66**	<10	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	<50	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	----	<100	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	<100	----	----
C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	**79**	<10	----	----
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	**41**	<10	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	----	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	----	<100	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	<100	----	----
>C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	<50	----	----
>C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	<50	----	----

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH05_0.5	TSC	BH01_0.2m	----	----
				Sampling date / time	24-Feb-2021 00:00	22-Feb-2021 00:00	26-Feb-2021 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2106968-048	ES2106968-049	ES2106968-050	--------	--------
					Result	Result	Result	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	**0.2**	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	**15.7**	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	**2.7**	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	**13.3**	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	**5.7**	<0.5	----	----
Sum of BTEX	----	0.2	mg/kg		<0.2	**37.6**	<0.2	----	----
Total Xylenes	----	0.5	mg/kg		<0.5	**19.0**	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**79.2**	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**99.6**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**84.9**	----	**89.6**	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**87.5**	----	**87.5**	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**67.7**	----	**74.6**	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**95.5**	----	**96.5**	----	----
Anthracene-d10	1719-06-8	0.5	%		**96.2**	----	**93.1**	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		**92.1**	----	**91.7**	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**86.1**	**81.4**	**86.8**	----	----
Toluene-D8	2037-26-5	0.2	%		**92.0**	**94.9**	**96.3**	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		**98.1**	**96.5**	**97.8**	----	----

Sub-Matrix: **SOLID**
(Matrix: **SOLID**)

Compound	CAS Number	LOR	Unit	Sample ID	TP09_0.5 FRAG	----	----	----	----
				Sampling date / time	24-Feb-2021 00:00	----	----	----	----
					ES2106968-032	--------	--------	--------	--------
					Result	----	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples									
Asbestos Detected	1332-21-4	0.1	g/kg		**Yes**	----	----	----	----
Asbestos Type	1332-21-4	-	--		**Ch**	----	----	----	----
Asbestos (Trace)	1332-21-4	5	Fibres		**N/A**	----	----	----	----
Sample weight (dry)	----	0.01	g		**25.1**	----	----	----	----
Synthetic Mineral Fibre	----	0.1	g/kg		**No**	----	----	----	----
Organic Fibre	----	0.1	g/kg		**No**	----	----	----	----
APPROVED IDENTIFIER:	----	-	--		**B.SCHRADER**	----	----	----	----

Sub-Matrix: **SOIL**

Method: Compound	Sample ID : Sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	TP13 : 0.1 - 24-Feb-2021 00:00	Mid brown soil.
EA200: Description	TP05 : 0.5 - 24-Feb-2021 00:00	Mid brown soil containing one asbestos fibre bundle approximately 10x2x0.5mm.
EA200: Description	TP14 : 0.1 - 24-Feb-2021 00:00	Mid brown soil containing one piece of asbestos fibre board approximately 5x3x1mm.
EA200: Description	TP02 : 0.1 - 24-Feb-2021 00:00	Mid brown soil.
EA200: Description	TP01 : 0.1 - 24-Feb-2021 00:00	Mid brown soil.
EA200: Description	TP06 : 0..1 - 24-Feb-2021 00:00	Mid brown soil.
EA200: Description	TP15 : 0.1 - 24-Feb-2021 00:00	Mid brown soil.
EA200: Description	TP08 : 0.2 - 24-Feb-2021 00:00	Mid brown soil.
EA200: Description	TP07 : 0.5 - 24-Feb-2021 00:00	Mid brown soil.
EA200: Description	BH03 : 0.7 - 25-Feb-2021 00:00	Mid brown soil.
EA200: Description	BH02 : 1.0 - 25-Feb-2021 00:00	Mid brown soil containing two pieces of asbestos fibre board approximately 15x10x3mm.
EA200: Description	BH04/GW01 : 0.5 - 24-Feb-2021 00:00	Mid brown soil.
EA200: Description	BH05 : 0.5 - 24-Feb-2021 00:00	Mid brown soil.
EA200: Description	TP12 : 0.1 - 24-Feb-2021 00:00	Mid brown soil.
EA200: Description	TP11 : 0.1 - 24-Feb-2021 00:00	Mid brown soil.
EA200: Description	TP10 : 0.1 - 24-Feb-2021 00:00	Mid brown soil.
EA200: Description	TP04 : 0.1 - 24-Feb-2021 00:00	Mid brown soil.
EA200: Description	TP09 : 0.5 - 24-Feb-2021 00:00	Mid brown soil.

Sub-Matrix: **SOLID**

Method: Compound	Sample ID : Sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples		
EA200: Description	TP09 : 0.5 FRAG - 24-Feb-2021 00:00	Several pieces of asbestos cement sheeting approximately 40x20x5mm.

Sub-Matrix: **SOIL**

Compound	*CAS Number*	%	
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

Analysis conducted by ALS Newcastle, NATA accreditation no. 825, site no. 1656 (Chemistry) 9854 (Biology).

(SOIL) EA200: AS 4964 - 2004 Identification of Asbestos in Soils

(SOIL) EA200N: Asbestos Quantification (non-NATA)

(SOLID) EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples

QUALITY CONTROL REPORT

Work Order	: **ES2106968**	Page	: 1 of 16
Client	: **WSP Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: Leila Bowe	Contact	: Brenda Hong
Address	: ABN: 80 078 004 798 GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: PS123745 - EMKC ST MARYS ESA	Date Samples Received	: 25-Feb-2021
Order number	: ----	Date Analysis Commenced	: 02-Mar-2021
C-O-C number	: ----	Issue Date	: 05-Mar-2021
Sampler	: Leila Bowe		
Site	: ----		
Quote number	: EN/085/17		
No. of samples received	: 51		
No. of samples analysed	: 39		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Alana Smylie	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Alexander Ristoski	Laboratory Technican	Newcastle - Asbestos, Mayfield West, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

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

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

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

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

Sub-Matrix: **SOIL**

EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3538628)									
ES2106345-004	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	22	21	0.00	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	12	11	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	14	13	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	13	16	16.4	No Limit
		EG005T: □inc	7440-66-6	5	mg/kg	26	24	6.23	No Limit
ES2106968-015	TP05□1.0	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	21	16	28.2	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	5	3	57.6	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	12	6	65.3	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	64	48	28.3	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	229	□91	86.1	0% - 20%
		EG005T: □inc	7440-66-6	5	mg/kg	47	18	90.4	No Limit
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3538630)									
ES2106968-048	BH05□0.5	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	11	11	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	5	6	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	10	11	13.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	8	7	0.00	No Limit
		EG005T: □inc	7440-66-6	5	mg/kg	17	18	0.00	No Limit
ES2106968-039	QA01	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	9	12	24.1	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	4	5	0.00	No Limit

Sub-Matrix: **SOIL**

EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3538630) - continued									
ES2106968-039	QA01	EG005T: Arsenic	7440-38-2	5	mg/kg	6	7	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	9	11	22.5	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	32	32	0.00	No Limit
		EG005T: □inc	7440-66-6	5	mg/kg	61	57	7.23	0% - 50%
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3541175)									
ES2106968-050	BH01□0.2m	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	56	□45	21.0	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	79	63	22.4	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	102	117	14.4	0% - 20%
		EG005T: □inc	7440-66-6	5	mg/kg	128	138	7.47	0% - 20%
ES2106968-050	BH01□0.2m	EG005T: Chromium	7440-47-3	2	mg/kg	42	47	11.0	0% - 20%
ES2107392-006	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	14	13	9.72	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	15	10	43.9	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	37	31	17.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	20	18	10.0	No Limit
		EG005T: □inc	7440-66-6	5	mg/kg	66	45	38.2	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3538632)									
ES2106823-001	Anonymous	EA055: Moisture Content	----	0.1	%	41.0	47.3	14.1	0% - 20%
ES2106968-005	TP12□0.5	EA055: Moisture Content	----	0.1	%	10.3	15.1	37.9	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3538633)									
ES2106968-030	TP15□1.0	EA055: Moisture Content	----	0.1	%	4.2	5.2	20.4	No Limit
ES2106988-002	Anonymous	EA055: Moisture Content	----	0.1	%	89.4	89.4	0.00	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3541180)									
ES2107096-001	Anonymous	EA055: Moisture Content	----	0.1	%	21.9	20.7	5.63	0% - 20%
EW2100904-002	Anonymous	EA055: Moisture Content	----	0.1	%	16.1	17.6	8.67	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3538629)									
ES2106345-004	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	0.2	0.00	No Limit
ES2106968-015	TP05□1.0	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	<0.1	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3538631)									
ES2106968-039	QA01	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3541176)									
ES2106968-050	BH01□0.2m	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES2107392-006	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3539247)									
ES2106968-002	TP13□0.5	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit

Sub-Matrix: **SOIL**

EP068A: Organochlorine Pesticides (OC) (QC Lot: 3539247) - continued									
ES2106968-002	TP13□0.5	EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	0.27	0.31	14.3	No Limit
		EP068: 4.4□DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4□DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4□DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
ES2106968-030	TP15□1.0	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4□DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4□DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4□DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit

Sub-Matrix: **SOIL**

EP068B: Organophosphorus Pesticides (OP) (QC Lot: 3539247)									
ES2106968-002	TP13□0.5	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
ES2106968-030	TP15□1.0	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3539246)									
ES2106968-002	TP13□0.5	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3539246) - continued									
ES2106968-002	TP13□0.5	EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES2106968-030	TP15□1.0	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3539250)									

Sub-Matrix: **SOIL**

EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3539250) - continued									
ES2106954-002	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES2107069-009	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3538809)									
ES2106968-002	TP13□0.5	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES2106968-030	TP15□1.0	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3538815)									
ES2106679-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES2106929-002	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3539245)									
ES2106968-002	TP13□0.5	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES2106968-030	TP15□1.0	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3539249)									
ES2106954-002	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES2107069-009	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3538809)									
ES2106968-002	TP13□0.5	EP080: C6 - C10 Fraction	C6□C10	10	mg/kg	<10	<10	0.00	No Limit
ES2106968-030	TP15□1.0	EP080: C6 - C10 Fraction	C6□C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3538815)									
ES2106679-001	Anonymous	EP080: C6 - C10 Fraction	C6□C10	10	mg/kg	<10	<10	0.00	No Limit
ES2106929-002	Anonymous	EP080: C6 - C10 Fraction	C6□C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3539245)									
ES2106968-002	TP13□0.5	EP071: □C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: □C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: □C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES2106968-030	TP15□1.0	EP071: □C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: □C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: □C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3539249)									
ES2106954-002	Anonymous	EP071: □C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: □C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: □C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES2107069-009	Anonymous	EP071: □C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: □C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: □C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit

Sub-Matrix: **SOIL**

EP080: BTEXN (QC Lot: 3538809)									
ES2106968-002	TP13□0.5	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- □ para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES2106968-030	TP15□1.0	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- □ para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EP080: BTEXN (QC Lot: 3538815)									
ES2106679-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- □ para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES2106929-002	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- □ para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

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

Sub-Matrix: **SOIL**

EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3538628)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	92.7	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	86.1	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	20.2 mg/kg	93.0	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	93.0	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	62.1 mg/kg	85.7	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.4 mg/kg	87.2	80.0	120
EG005T: □inc	7440-66-6	5	mg/kg	<5	162 mg/kg	78.7	66.0	133
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3538630)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	91.2	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	74.9	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	20.2 mg/kg	86.9	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	90.5	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	62.1 mg/kg	83.8	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.4 mg/kg	81.6	80.0	120
EG005T: □inc	7440-66-6	5	mg/kg	<5	162 mg/kg	72.4	66.0	133
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3541175)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	112	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	119	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	20.2 mg/kg	126	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	94.7	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	62.1 mg/kg	117	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.4 mg/kg	117	80.0	120
EG005T: □inc	7440-66-6	5	mg/kg	<5	162 mg/kg	87.4	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3538629)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.073 mg/kg	86.6	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3538631)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.073 mg/kg	86.8	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3541176)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.073 mg/kg	74.1	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 3539247)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	95.3	69.0	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	89.9	65.0	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	98.1	67.0	119

Sub-Matrix: **SOIL**

EP068A: Organochlorine Pesticides (OC) (QCLot: 3539247) - continued								
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	88.9	68.0	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	83.9	65.0	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	87.8	67.0	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	92.9	69.0	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	92.0	62.0	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	91.0	63.0	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	89.7	66.0	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	90.3	64.0	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	90.0	66.0	116
EP068: 4.4□DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	87.4	67.0	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	88.3	67.0	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	91.2	69.0	115
EP068: 4.4□DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	97.1	69.0	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	81.5	56.0	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	81.1	62.0	124
EP068: 4.4□DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	80.4	66.0	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	80.0	64.0	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	82.0	54.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3539247)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	75.7	59.0	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	77.8	62.0	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	95.1	54.0	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	85.2	67.0	119
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	88.6	70.0	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	92.8	72.0	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	87.6	68.0	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	93.2	68.0	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	91.4	69.0	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	93.2	76.0	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	88.1	64.0	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	91.8	70.0	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	94.2	69.0	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	92.8	66.0	118
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	86.0	68.0	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	87.8	62.0	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	90.6	68.0	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	84.3	65.0	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	62.6	41.0	123
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3539246)								

Sub-Matrix: **SOIL**

EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3539246) - continued								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	91.8	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	97.5	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	101	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	101	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	102	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	92.9	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	94.0	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	90.8	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	90.0	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	100	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	92.7	68.0	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	100	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	97.5	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	92.7	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	97.2	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	95.4	63.0	121
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3539250)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	94.5	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	102	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	97.3	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	94.8	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	98.6	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	85.9	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	92.4	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	95.3	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	89.5	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	96.2	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	93.1	68.0	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	90.0	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	91.4	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	97.8	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	90.4	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	90.7	63.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3538809)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	90.7	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3538815)								

Sub-Matrix: **SOIL**

EP080/071: Total Petroleum Hydrocarbons (QCLot: 3538815) - continued								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	93.2	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3539245)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	101	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	104	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	99.3	71.0	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3539249)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	101	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	96.8	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	91.7	71.0	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3538809)								
EP080: C6 - C10 Fraction	C6□C10	10	mg/kg	<10	31 mg/kg	89.3	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3538815)								
EP080: C6 - C10 Fraction	C6□C10	10	mg/kg	<10	31 mg/kg	92.8	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3539245)								
EP071: □C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	110	77.0	125
EP071: □C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	107	74.0	138
EP071: □C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	111	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3539249)								
EP071: □C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	97.8	77.0	125
EP071: □C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	96.0	74.0	138
EP071: □C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	97.1	63.0	131
EP080: BTEXN (QCLot: 3538809)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	92.3	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	89.9	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	91.1	65.0	117
EP080: meta- □ para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	91.0	66.0	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	96.2	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	94.1	63.0	119
EP080: BTEXN (QCLot: 3538815)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	87.8	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	101	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	92.6	65.0	117
EP080: meta- □ para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	96.2	66.0	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	100.0	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	95.6	63.0	119

Matrix Spike (MS) Recoveries

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

Sub-Matrix: **SOIL**

					Matrix Spike (MS) Report		
					Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Spike Concentration		Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3538628)							
ES2106345-004	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	89.0	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	89.7	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	91.3	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	94.1	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	94.3	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	88.3	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	102	66.0	133
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3538630)							
ES2106968-039	QA01	EG005T: Arsenic	7440-38-2	50 mg/kg	97.2	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	84.6	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	94.3	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	92.5	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	113	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	84.0	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	103	66.0	133
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3541175)							
ES2106968-050	BH01 0.2m	EG005T: Arsenic	7440-38-2	50 mg/kg	86.8	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	82.8	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	129	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	83.0	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	75.0	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	89.5	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	73.7	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3538629)							
ES2106345-004	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	97.2	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3538631)							
ES2106968-039	QA01	EG035T: Mercury	7439-97-6	5 mg/kg	99.2	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3541176)							
ES2106968-050	BH01 0.2m	EG035T: Mercury	7439-97-6	5 mg/kg	89.0	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 3539247)							
ES2106968-002	TP13 0.5	EP068: gamma-BHC	58-89-9	0.5 mg/kg	92.0	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	89.6	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	92.9	70.0	130

Sub-Matrix: **SOIL**

EP068A: Organochlorine Pesticides (OC) (QCLot: 3539247) - continued							
ES2106968-002	TP13□0.5	EP068: Dieldrin	60-57-1	0.5 mg/kg	87.8	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	85.1	70.0	130
		EP068: 4.4□DDT	50-29-3	2 mg/kg	97.9	70.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3539247)							
ES2106968-002	TP13□0.5	EP068: Diazinon	333-41-5	0.5 mg/kg	103	70.0	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	98.4	70.0	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	86.6	70.0	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	83.0	70.0	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	86.2	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3539246)							
ES2106968-002	TP13□0.5	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	104	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	92.5	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3539250)							
ES2106954-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	95.4	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	95.5	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3538809)							
ES2106968-002	TP13□0.5	EP080: C6 - C9 Fraction	----	32.5 mg/kg	94.2	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3538815)							
ES2106679-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	97.9	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3539245)							
ES2106968-002	TP13□0.5	EP071: C10 - C14 Fraction	----	523 mg/kg	104	73.0	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	110	53.0	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	117	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3539249)							
ES2106954-002	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	91.9	73.0	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	113	53.0	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	110	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3538809)							
ES2106968-002	TP13□0.5	EP080: C6 - C10 Fraction	C6□C10	37.5 mg/kg	97.3	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3538815)							
ES2106679-001	Anonymous	EP080: C6 - C10 Fraction	C6□C10	37.5 mg/kg	95.7	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3539245)							
ES2106968-002	TP13□0.5	EP071: □C10 - C16 Fraction	----	860 mg/kg	102	73.0	137
		EP071: □C16 - C34 Fraction	----	3223 mg/kg	120	53.0	131
		EP071: □C34 - C40 Fraction	----	1058 mg/kg	93.1	52.0	132

Sub-Matrix: **SOIL**

EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3539249)							
ES2106954-002	Anonymous	EP071: C10 - C16 Fraction	----	860 mg/kg	109	73.0	137
		EP071: C16 - C34 Fraction	----	3223 mg/kg	106	53.0	131
		EP071: C34 - C40 Fraction	----	1058 mg/kg	92.7	52.0	132
EP080: BTEXN (QCLot: 3538809)							
ES2106968-002	TP13 0.5	EP080: Benzene	71-43-2	2.5 mg/kg	91.3	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	88.7	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	92.6	70.0	130
		EP080: meta- para-Xylene	108-38-3 106-42-3	2.5 mg/kg	89.9	70.0	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	95.0	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	82.5	70.0	130
EP080: BTEXN (QCLot: 3538815)							
ES2106679-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	77.5	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	82.3	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	88.2	70.0	130
		EP080: meta- para-Xylene	108-38-3 106-42-3	2.5 mg/kg	86.5	70.0	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	91.0	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	82.4	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2106968**	Page	: 1 of 10
Client	: **WSP Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: Leila Bowe	Telephone	: +61 2 8784 8555
Project	: PS123745 - EMKC ST MARYS ESA	Date Samples Received	: 25-Feb-2021
Site	: ----	Issue Date	: 05-Mar-2021
Sampler	: Leila Bowe	No. of samples received	: 51
Order number	: ----	No. of samples analysed	: 39

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

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

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

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

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

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- **NO Quality Control Sample Fre□uency Outliers exist.**

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Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EG005(ED093)T: Total Metals by ICP-AES	ES2106968--015	TP05_1.0	**Lead**	7439-92-1	86.1 %	0% - 20%	**RPD exceeds LOR based limits**
EG005(ED093)T: Total Metals by ICP-AES	ES2106968--050	BH01□0.2m	**Nickel**	7440-02-0	21.0 %	0% - 20%	**RPD exceeds LOR based limits**

An ysis Ho din Time omp i nce

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for □□ □□ vary according to analytes of interest. □inyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all □OC analytes and should be verified in case the reported breach is a false positive or □inyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL** Evaluation: û = Holding time breach ; ü = Within holding time.

□ethod ont ine / Client Sample ID(s)	S mp e □ □	Extraction / Preparation			Analysis		
		D te e□t □ted	Due for extraction	Evaluation	D te □ ys □d	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass □ar - Unpreserved (EA055)							
TP13_0.5, TP12_0.5, TP11_0.5, TP04_0.5, TP05_1.0, TP03_0.5, TP14_0.5, TP02_1.0, TP01_0.5, TP06_0.5, TP15_1.0, TP09_0.5, TP08_1.0, TP07_0.5, QA01, BH04_0.2, BH05_0.5	**24-Feb-2021**	**----**	----	----	**02-Mar-2021**	10-Mar-2021	Π
Soil Glass □ar - Unpreserved (EA055)							
BH02_0.5, BH03_0.5	**25-Feb-2021**	**----**	----	----	**02-Mar-2021**	11-Mar-2021	ü
Soil Glass □ar - Unpreserved (EA055)							
BH01_0.2m	**26-Feb-2021**	**----**	----	----	**03-Mar-2021**	12-Mar-2021	ü

Matrix: **SOIL**

Evaluation: û = Holding time breach ; ü = Within holding time.

ethod / ont ine / Client Sample ID(s)		S mp e	Extraction / Preparation			Analysis		
			D te e t ted	Due for extraction	Evaluation	D te	Due for analysis	Evaluation
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Snap Lock Bag - Friable Asbestos/PSD Bag (EA200)								
TP13_0.1,	TP12_0.1,	**24-Feb-2021**	**----**	----	----	**02-Mar-2021**	23-Aug-2021	Π
TP11_0.1,	TP10_0.1,							
TP04_0.1,	TP05_0.5,							
TP14_0.1,	TP02_0.1,							
TP01_0.1,	TP06_0..1,							
TP15_0.1,	TP09_0.5,							
TP08_0.2,	TP07_0.5,							
BH04/GW01_0.5,	BH05_0.5							
Snap Lock Bag - Friable Asbestos/PSD Bag (EA200)								
BH03_0.7,	BH02_1.0	**25-Feb-2021**	**----**	----	----	**02-Mar-2021**	24-Aug-2021	ü
EA200N: Asbestos Quantification (non-NATA)								
Snap Lock Bag - Friable Asbestos/PSD Bag (EA200N)								
TP09_0.5		**24-Feb-2021**	**----**	----	----	**02-Mar-2021**	23-Aug-2021	ü
EG005(ED093)T: Total Metals by ICP-AES								
Soil Glass ar - Unpreserved (EG005T)								
TP13_0.5,	TP12_0.5,	**24-Feb-2021**	**02-Mar-2021**	23-Aug-2021	Π	**02-Mar-2021**	23-Aug-2021	Π
TP11_0.5,	TP04_0.5,							
TP05_1.0,	TP03_0.5,							
TP14_0.5,	TP02_1.0,							
TP01_0.5,	TP06_0.5,							
TP15_1.0,	TP09_0.5,							
TP08_1.0,	TP07_0.5,							
QA01,	BH04_0.2,							
BH05_0.5								
Soil Glass ar - Unpreserved (EG005T)								
BH02_0.5,	BH03_0.5	**25-Feb-2021**	**02-Mar-2021**	24-Aug-2021	Π	**02-Mar-2021**	24-Aug-2021	ü
Soil Glass ar - Unpreserved (EG005T)								
BH01_0.2m		**26-Feb-2021**	**03-Mar-2021**	25-Aug-2021	Π	**03-Mar-2021**	25-Aug-2021	ü

Matrix: **SOIL**

Evaluation: û = Holding time breach ; ü = Within holding time.

ethod / ont ine / Client Sample ID(s)	S mp e	Extraction / Preparation			Analysis		
		D te e t ted	Due for extraction	Evaluation	D te	Due for analysis	Evaluation
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass ar - Unpreserved (EG035T)							
TP13_0.5, TP12_0.5, TP11_0.5, TP04_0.5, TP05_1.0, TP03_0.5, TP14_0.5, TP02_1.0, TP01_0.5, TP06_0.5, TP15_1.0, TP09_0.5, TP08_1.0, TP07_0.5, QA01, BH04_0.2, BH05_0.5	**24-Feb-2021**	**02-Mar-2021**	24-Mar-2021	Π	**03-Mar-2021**	24-Mar-2021	Π
Soil Glass ar - Unpreserved (EG035T)							
BH02_0.5, BH03_0.5	**25-Feb-2021**	**02-Mar-2021**	25-Mar-2021	Π	**03-Mar-2021**	25-Mar-2021	ü
Soil Glass ar - Unpreserved (EG035T)							
BH01_0.2m	**26-Feb-2021**	**03-Mar-2021**	26-Mar-2021	Π	**04-Mar-2021**	26-Mar-2021	ü
EP068A: Organochlorine Pesticides (OC)							
Soil Glass ar - Unpreserved (EP068)							
TP13_0.5, TP12_0.5, TP11_0.5, TP04_0.5, TP05_1.0, TP03_0.5, TP14_0.5, TP02_1.0, TP01_0.5, TP06_0.5, TP15_1.0, TP09_0.5, TP07_0.5, QA01, BH04_0.2, BH05_0.5	**24-Feb-2021**	**02-Mar-2021**	10-Mar-2021	Π	**03-Mar-2021**	11-Apr-2021	Π
Soil Glass ar - Unpreserved (EP068)							
BH02_0.5, BH03_0.5	**25-Feb-2021**	**02-Mar-2021**	11-Mar-2021	Π	**03-Mar-2021**	11-Apr-2021	ü
EP068B: Organophosphorus Pesticides (OP)							
Soil Glass ar - Unpreserved (EP068)							
TP13_0.5, TP12_0.5, TP11_0.5, TP04_0.5, TP05_1.0, TP03_0.5, TP14_0.5, TP02_1.0, TP01_0.5, TP06_0.5, TP15_1.0, TP09_0.5, TP07_0.5, QA01, BH04_0.2, BH05_0.5	**24-Feb-2021**	**02-Mar-2021**	10-Mar-2021	Π	**03-Mar-2021**	11-Apr-2021	Π
Soil Glass ar - Unpreserved (EP068)							
BH02_0.5, BH03_0.5	**25-Feb-2021**	**02-Mar-2021**	11-Mar-2021	Π	**03-Mar-2021**	11-Apr-2021	ü

Matrix: **SOIL**

Evaluation: û = Holding time breach ; ü = Within holding time.

ethod / ont ine / Client Sample ID(s)	S mp e	Extraction / Preparation			Analysis		
		D te e t ted	Due for extraction	Evaluation	D te	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass ar - Unpreserved (EP075(SIM))							
TP13_0.5, TP12_0.5, TP11_0.5, TP04_0.5, TP05_1.0, TP03_0.5, TP14_0.5, TP02_1.0, TP01_0.5, TP06_0.5, TP15_1.0, TP09_0.5, TP08_1.0, TP07_0.5, QA01, BH04_0.2, BH05_0.5	**24-Feb-2021**	**02-Mar-2021**	10-Mar-2021	Π	**03-Mar-2021**	11-Apr-2021	Π
Soil Glass ar - Unpreserved (EP075(SIM))							
BH02_0.5, BH03_0.5	**25-Feb-2021**	**02-Mar-2021**	11-Mar-2021	Π	**03-Mar-2021**	11-Apr-2021	ü
Soil Glass ar - Unpreserved (EP075(SIM))							
BH01_0.2m	**26-Feb-2021**	**02-Mar-2021**	12-Mar-2021	Π	**04-Mar-2021**	11-Apr-2021	ü
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass ar - Unpreserved (EP080)							
TRIP SPIKE	**22-Feb-2021**	**02-Mar-2021**	08-Mar-2021	Π	**03-Mar-2021**	08-Mar-2021	ü
Soil Glass ar - Unpreserved (EP080)							
TSC	**22-Feb-2021**	**02-Mar-2021**	08-Mar-2021	Π	**04-Mar-2021**	08-Mar-2021	ü
Soil Glass ar - Unpreserved (EP071)							
TP13_0.5, TP12_0.5, TP11_0.5, TP04_0.5, TP05_1.0, TP03_0.5, TP14_0.5, TP02_1.0, TP01_0.5, TP06_0.5, TP15_1.0, TP09_0.5, TP08_1.0, TP07_0.5, QA01, TRIP BLABK, BH04_0.2, BH05_0.5	**24-Feb-2021**	**02-Mar-2021**	10-Mar-2021	Π	**03-Mar-2021**	11-Apr-2021	Π
Soil Glass ar - Unpreserved (EP080)							
BH05_0.5	**24-Feb-2021**	**02-Mar-2021**	10-Mar-2021	Π	**04-Mar-2021**	10-Mar-2021	ü
Soil Glass ar - Unpreserved (EP080)							
BH02_0.5, BH03_0.5	**25-Feb-2021**	**02-Mar-2021**	11-Mar-2021	Π	**03-Mar-2021**	11-Mar-2021	ü
Soil Glass ar - Unpreserved (EP080)							
BH01_0.2m	**26-Feb-2021**	**02-Mar-2021**	12-Mar-2021	Π	**04-Mar-2021**	12-Mar-2021	ü

Matrix: **SOIL**

Evaluation: û = Holding time breach ; ü = Within holding time.

□ethod / ont ine / Client Sample ID(s)	S mp e □ □□	Extraction / Preparation			Analysis		
		D te e□t □ted	Due for extraction	Evaluation	D te □ □□□□	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass □ar - Unpreserved (EP080)							
TRIP SPIKE	**22-Feb-2021**	**02-Mar-2021**	08-Mar-2021	Π	**03-Mar-2021**	08-Mar-2021	ü
Soil Glass □ar - Unpreserved (EP080)							
TSC	**22-Feb-2021**	**02-Mar-2021**	08-Mar-2021	Π	**04-Mar-2021**	08-Mar-2021	ü
Soil Glass □ar - Unpreserved (EP071)							
TP13_0.5, TP12_0.5, TP11_0.5, TP04_0.5, TP05_1.0, TP03_0.5, TP14_0.5, TP02_1.0, TP01_0.5, TP06_0.5, TP15_1.0, TP09_0.5, TP08_1.0, TP07_0.5, QA01, TRIP BLABK, BH04_0.2, BH05_0.5	**24-Feb-2021**	**02-Mar-2021**	10-Mar-2021	Π	**03-Mar-2021**	11-Apr-2021	Π
Soil Glass □ar - Unpreserved (EP080)							
BH05_0.5	**24-Feb-2021**	**02-Mar-2021**	10-Mar-2021	Π	**04-Mar-2021**	10-Mar-2021	ü
Soil Glass □ar - Unpreserved (EP080)							
BH02_0.5, BH03_0.5	**25-Feb-2021**	**02-Mar-2021**	11-Mar-2021	Π	**03-Mar-2021**	11-Mar-2021	ü
Soil Glass □ar - Unpreserved (EP080)							
BH01_0.2m	**26-Feb-2021**	**02-Mar-2021**	12-Mar-2021	Π	**04-Mar-2021**	12-Mar-2021	ü
EP080: BTEXN							
Soil Glass □ar - Unpreserved (EP080)							
TRIP SPIKE	**22-Feb-2021**	**02-Mar-2021**	08-Mar-2021	Π	**03-Mar-2021**	08-Mar-2021	ü
Soil Glass □ar - Unpreserved (EP080)							
TSC	**22-Feb-2021**	**02-Mar-2021**	08-Mar-2021	Π	**04-Mar-2021**	08-Mar-2021	ü
Soil Glass □ar - Unpreserved (EP080)							
TP13_0.5, TP12_0.5, TP11_0.5, TP04_0.5, TP05_1.0, TP03_0.5, TP14_0.5, TP02_1.0, TP01_0.5, TP06_0.5, TP15_1.0, TP09_0.5, TP08_1.0, TP07_0.5, QA01, TRIP BLABK, BH04_0.2	**24-Feb-2021**	**02-Mar-2021**	10-Mar-2021	Π	**03-Mar-2021**	10-Mar-2021	Π
Soil Glass □ar - Unpreserved (EP080)							
BH05_0.5	**24-Feb-2021**	**02-Mar-2021**	10-Mar-2021	Π	**04-Mar-2021**	10-Mar-2021	ü
Soil Glass □ar - Unpreserved (EP080)							
BH02_0.5, BH03_0.5	**25-Feb-2021**	**02-Mar-2021**	11-Mar-2021	Π	**03-Mar-2021**	11-Mar-2021	ü
Soil Glass □ar - Unpreserved (EP080)							
BH01_0.2m	**26-Feb-2021**	**02-Mar-2021**	12-Mar-2021	Π	**04-Mar-2021**	12-Mar-2021	ü

Matrix: **SOLID**

Evaluation: û = Holding time breach ; ü = Within holding time.

Matrix: **SOLID**

Evaluation: = Holding time breach = Within holding time.

		Extraction / Preparation			Analysis		
Client Sample ID(s)			Due for extraction	Evaluation		Due for analysis	Evaluation
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples							
Snap Lock Bag - Friable Asbestos/PSD Bag (EA200)							
TP09 0.5 FRAG	**24-Feb-2021**	**----**	----	----	**02-Mar-2021**	23-Aug-2021	

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: □ = Quality Control frequency not within specification □ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	□□□	□□□□□□□	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	6	53	**11.32**	**10.00**	□	NEPM 2013 B3 □ ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	4	35	**11.43**	**10.00**	□	NEPM 2013 B3 □ ALS QC Standard
Pesticides by GCMS	EP068	2	19	**10.53**	**10.00**	□	NEPM 2013 B3 □ ALS QC Standard
Total Mercury by FIMS	EG035T	5	47	**10.64**	**10.00**	□	NEPM 2013 B3 □ ALS QC Standard
Total Metals by ICP-AES	EG005T	7	53	**13.21**	**10.00**	□	NEPM 2013 B3 □ ALS QC Standard
TRH - Semivolatile Fraction	EP071	4	40	**10.00**	**10.00**	□	NEPM 2013 B3 □ ALS QC Standard
TRH □olatiles/BTEX	EP080	4	40	**10.00**	**10.00**	□	NEPM 2013 B3 □ ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	2	35	**5.71**	**5.00**	□	NEPM 2013 B3 □ ALS QC Standard
Pesticides by GCMS	EP068	1	19	**5.26**	**5.00**	□	NEPM 2013 B3 □ ALS QC Standard
Total Mercury by FIMS	EG035T	3	47	**6.38**	**5.00**	□	NEPM 2013 B3 □ ALS QC Standard
Total Metals by ICP-AES	EG005T	3	53	**5.66**	**5.00**	□	NEPM 2013 B3 □ ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	40	**5.00**	**5.00**	□	NEPM 2013 B3 □ ALS QC Standard
TRH □olatiles/BTEX	EP080	2	40	**5.00**	**5.00**	□	NEPM 2013 B3 □ ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	2	35	**5.71**	**5.00**	□	NEPM 2013 B3 □ ALS QC Standard
Pesticides by GCMS	EP068	1	19	**5.26**	**5.00**	□	NEPM 2013 B3 □ ALS QC Standard
Total Mercury by FIMS	EG035T	3	47	**6.38**	**5.00**	□	NEPM 2013 B3 □ ALS QC Standard
Total Metals by ICP-AES	EG005T	3	53	**5.66**	**5.00**	□	NEPM 2013 B3 □ ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	40	**5.00**	**5.00**	□	NEPM 2013 B3 □ ALS QC Standard
TRH □olatiles/BTEX	EP080	2	40	**5.00**	**5.00**	□	NEPM 2013 B3 □ ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	2	35	**5.71**	**5.00**	□	NEPM 2013 B3 □ ALS QC Standard
Pesticides by GCMS	EP068	1	19	**5.26**	**5.00**	□	NEPM 2013 B3 □ ALS QC Standard
Total Mercury by FIMS	EG035T	3	47	**6.38**	**5.00**	□	NEPM 2013 B3 □ ALS QC Standard
Total Metals by ICP-AES	EG005T	3	53	**5.66**	**5.00**	□	NEPM 2013 B3 □ ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	40	**5.00**	**5.00**	□	NEPM 2013 B3 □ ALS QC Standard
TRH □olatiles/BTEX	EP080	2	40	**5.00**	**5.00**	□	NEPM 2013 B3 □ ALS QC Standard

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Asbestos Classification and Quantitation per NEPM 2013	EA200N	SOIL	Asbestos Classification and Quantitation per NEPM with Confirmation of Identification by AS 4964 - Gravimetric determination of Asbestos Containing Material, Fibrous Asbestos, Asbestos Fines and sample weight and calculation of percentage concentrations per NEPM protocols. Asbestos (Fines and Fibrous FA+AF) is reported as the equivalent weight in the sample received after accounting for sub-sampling (where applicable for the <7mm and/or <2mm fractions).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120 USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold apour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH olatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.
Asbestos Identification in Bulk Solids	EA200	SOLID	In house: Referenced to AS 4964 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).

Preparation Methods	Method	Matrix	Method Descriptions
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2106968**

Client	: **WSP Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: Leila Bowe	Contact	: Brenda Hong
Address	: ABN: 80 078 004 798 GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: leila.bowe wsp.com	E-mail	: Brenda.Hong ALSGlobal.com
Telephone	: ----	Telephone	: +61 2 8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: PS123745 - EMKC ST MARYS ESA	Page	: 1 of 4
Order number	: ----	Quote number	: ES2017PARBRINSW0009 (EN/085/17)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 ALS QC Standard
Site	: ----		
Sampler	: Leila Bowe		

Dates

Date Samples Received	: 25-Feb-2021 15:45	Issue Date	: 01-Mar-2021
Client Requested Due Date	: 05-Mar-2021	Scheduled Reporting Date	: **05-Mar-2021**

Delivery Details

Mode of Delivery	: Undefined	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 19.1 C - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 51 / 39

eneral Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Sample QA01A to be forwarded to Eurofins as per COC s.**
- **Sample QA01A sent to Eurofins**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis re uested.**
- **Sample(s) re uiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- Asbestos Analysis to be conducted by ALS Newcastle
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6 C for chemical analysis, and less than or equal to 10 C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation □on□Compliances

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

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

Summary of Sample(s) and Re□uested Analysis

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

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EA200 Asbestos Identification in Soils -	SOIL - EA200G Asbestos Identification in Soils -	SOIL - EA200N Asbestos in Soils - (<1kg samples ONLY)	SOIL - S-12 OC/OP Pesticides	SOIL - S-26 8 metals/TRH/BTEXN/PAH
ES2106968-001	24-Feb-2021 00:00	TP13□0.1			□				
ES2106968-002	24-Feb-2021 00:00	TP13□0.5		□				□	□
ES2106968-003	24-Feb-2021 00:00	TP13□3.0	□						
ES2106968-004	24-Feb-2021 00:00	TP12□0.1				□			
ES2106968-005	24-Feb-2021 00:00	TP12□0.5		□				□	□
ES2106968-006	24-Feb-2021 00:00	TP12□1.0	□						
ES2106968-007	24-Feb-2021 00:00	TP11□0.1				□			
ES2106968-008	24-Feb-2021 00:00	TP11□0.5		□				□	□
ES2106968-009	24-Feb-2021 00:00	TP10□0.1				□			
ES2106968-010	24-Feb-2021 00:00	TP10□0.5	□						
ES2106968-011	24-Feb-2021 00:00	TP04□0.1				□			
ES2106968-012	24-Feb-2021 00:00	TP04□0.5		□				□	□
ES2106968-013	24-Feb-2021 00:00	TP04□2.5	□						
ES2106968-014	24-Feb-2021 00:00	TP05□0.5			□				
ES2106968-015	24-Feb-2021 00:00	TP05□1.0		□				□	□
ES2106968-016	24-Feb-2021 00:00	TP03□0.5		□	□			□	□
ES2106968-017	24-Feb-2021 00:00	TP14□0.1			□				
ES2106968-018	24-Feb-2021 00:00	TP14□0.5		□				□	□
ES2106968-019	24-Feb-2021 00:00	TP02□0.1			□				
ES2106968-020	24-Feb-2021 00:00	TP02□0.5	□						
ES2106968-021	24-Feb-2021 00:00	TP02□1.0		□				□	□
ES2106968-022	24-Feb-2021 00:00	TP01□0.1			□				
ES2106968-023	24-Feb-2021 00:00	TP01□0.5		□				□	□
ES2106968-024	24-Feb-2021 00:00	TP01□1.5	□						
ES2106968-025	24-Feb-2021 00:00	TP06□0..1			□				
ES2106968-026	24-Feb-2021 00:00	TP06□0.5		□				□	□
ES2106968-027	24-Feb-2021 00:00	TP06□1.0	□						
ES2106968-028	24-Feb-2021 00:00	TP15□0.1			□				
ES2106968-029	24-Feb-2021 00:00	TP15□0.5	□						
ES2106968-030	24-Feb-2021 00:00	TP15□1.0		□				□	□
ES2106968-031	24-Feb-2021 00:00	TP09□0.5		□			□	□	□
ES2106968-033	24-Feb-2021 00:00	TP09□1.0	□						
ES2106968-034	24-Feb-2021 00:00	TP08□0.2			□				
ES2106968-035	24-Feb-2021 00:00	TP08□0.5	□						
ES2106968-036	24-Feb-2021 00:00	TP08□1.0		□					□

			(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EA200 Asbestos Identification in Soils -	SOIL - EA200G Asbestos Identification in Soils -	SOIL - EA200N Asbestos in Soils - (<1kg samples ONLY)	SOIL - S-12 OC/OP Pesticides	SOIL - S-26 8 metals/TRH/BTEXN/PAH
ES2106968-037	24-Feb-2021 00:00	TP07□0.5		☐	☐			☐	☐
ES2106968-038	24-Feb-2021 00:00	TP07□1.0	☐						
ES2106968-039	24-Feb-2021 00:00	QA01		☐				☐	☐
ES2106968-042	25-Feb-2021 00:00	BH03□0.7			☐				
ES2106968-043	25-Feb-2021 00:00	BH02□0.5		☐				☐	☐
ES2106968-044	25-Feb-2021 00:00	BH03□0.5		☐				☐	☐
ES2106968-045	25-Feb-2021 00:00	BH02□1.0			☐				
ES2106968-046	24-Feb-2021 00:00	BH04/GW01□0.5			☐				
ES2106968-047	24-Feb-2021 00:00	BH04□0.2		☐				☐	☐
ES2106968-048	24-Feb-2021 00:00	BH05□0.5		☐	☐			☐	☐
ES2106968-050	26-Feb-2021 00:00	BH01□0.2m		☐					☐
ES2106968-051	26-Feb-2021 00:00	BH01□0.5m	☐						

Matrix: **SOIL**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	SOIL - S-18 (NO MOIST) TRH(C6-C9)/BTEXN with No Moisture for TBs
ES2106968-040	24-Feb-2021 00:00	TRIP BLABK	☐
ES2106968-041	22-Feb-2021 00:00	TRIP SPIKE	☐
ES2106968-049	22-Feb-2021 00:00	TSC	☐

Matrix: **SOLID**

Laboratory sample ID	Sampling date / time	Sample ID	SOLID - EA200B Asbestos Identification in Bulk Solids (Excluding
ES2106968-032	24-Feb-2021 00:00	TP09□0.5 FRAG	□

Proactive □olding □ime Report

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

Re□uested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (IN□)	Email	AU.AccountsPayable□ wsp.com

Colin Mckay

- □AU Certificate of Analysis - NATA (COA)	Email	colin.mckay□ wsp.com
- □AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	colin.mckay□ wsp.com
- □AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	colin.mckay□ wsp.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	colin.mckay□ wsp.com
- Chain of Custody (CoC) (COC)	Email	colin.mckay□ wsp.com
- EDI Format - ENMRG (ENMRG)	Email	colin.mckay□ wsp.com
- EDI Format - ESDAT (ESDAT)	Email	colin.mckay□ wsp.com

Leila Bowe

- □AU Certificate of Analysis - NATA (COA)	Email	leila.bowe□ wsp.com
- □AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	leila.bowe□ wsp.com
- □AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	leila.bowe□ wsp.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	leila.bowe□ wsp.com
- A4 - AU Tax Invoice (IN□)	Email	leila.bowe□ wsp.com
- Chain of Custody (CoC) (COC)	Email	leila.bowe□ wsp.com
- EDI Format - ENMRG (ENMRG)	Email	leila.bowe□ wsp.com
- EDI Format - ESDAT (ESDAT)	Email	leila.bowe□ wsp.com

CHAIN OF CUSTODY

ALS Laboratory please tick →

CLIENT: WSP	TURNAROUND REQUIREMENTS: (Standard TAT may be too long for some tests e.g. Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE:		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: PS123745 - EMKC St Marys ESA	ALS QUOTE NO.: EN-085-17	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7	Freeze (produce) Ice Bricks present upon receipt: Yes No N/A
ORDER NUMBER:			Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Leila Bowe	CONTACT PH: 0468453715		Other comments: 19-1
SAMPLER: Leila Bowe	SAMPLER MOBILE: 0468453715		
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): Esdat and PDF		
Email Reports to: leila.bowe@wsp.com; colin.mckay@wsp.com			
Email Invoice to (will default to PM if no other addresses are listed): leila.bowe@wsp.com			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Leila Bowe			
DATE/TIME: 25/02/21	DATE/TIME: 25/2/21 15:45	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite prices) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (filtered bottle required).							
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant.	Hold	Additional Information (Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.)
1	TP03_0.1	24/02/21	S		1				X			
2	TP13_0.5				1	X		X				
3	TP13_3.0				1						X	
4	TP12_0.1				1				X			
5	TP12_0.5				1	X		X				
6	TP12_1.0				1						X	
7	TP11_0.1				1				X			
8	TP11_0.5				1	X		X				
9	TP10_0.1				1				X			
10	TP10_0.5				1						X	
11	TP04_0.1				1				X			
12	TP04_0.5				1	X		X				
TOTAL					12	4	0	4	5		3	

Environmental Division Sydney
Work Order Reference
ES2106968

Telephone : +61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; S = Sodium Hydroxide Preserved; SH = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Amber Glass Unpreserved Vial; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulfate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: WSP	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☒ Standard TAT (List due date):	**FOR LABORATORY USE ONLY (Circle)**
OFFICE:		☐ Non Standard or urgent TAT (List due date):	Custody Seal intact? Yes No N/A
PROJECT: PS123745 - EMKC St Marys ESA	ALS QUOTE NO.: EN-085-17	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER:		COC: 1 (2) 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Leila Bowe	CONTACT PH: 0468453715	OF: 1 2 3 (4) 5 6 7	Other comment: 19.1
SAMPLER: Leila Bowe	SAMPLER MOBILE: 0468453715		
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): Esoat and PDF		
Email Reports to: leila.bowe@wsp.com; colin.mckay@wsp.com			
Email Invoice to (will default to PM if no other addresses are listed): leila.bowe@wsp.com			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Leila Bowe	[signature]		
DATE/TIME: 25/02/21	DATE/TIME: 25/02/21 1545	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE — **SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)** — **CONTAINER INFORMATION** — **ANALYSIS REQUIRED including SUITES** (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant.	Hold.	Additional Information: Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
13	TP04_WA 2.5	24/02/21	S		1						X	
14	TP05_0.5				2				X			
15	TP05_1.0				1	X		X				
16	TP03_0.5				2	X		X	X			
17	TP14_0.1				1				X			
18	TP14_0.5				1	X		X				
19	TP02_0.1				1				X			
20	TP02_0.5				1						X	
21	TP02_1.0				1	X		X				
22	TP01_0.1				1				X			
23	TP01_0.5				1	X		X				
24	TP01_1.5				1						X	
				TOTAL	14	5	0	5	5		3	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: WSP

OFFICE:

PROJECT: PS127745 - EVAC St Marys ESA

ORDER NUMBER:

PROJECT MANAGER: Leila Bowe | CONTACT PH: 0468453715

SAMPLER: Leila Bowe | SAMPLER MOBILE: 0468453715

COC emailed to ALS? (YES / NO) | EDD FORMAT (or default): Esdat and PDF

Email Reports to: leila.bowe@wsp.com, colin.mckay@wsp.com

Email Invoice to (will default to PM if no other addresses are listed): leila.bowe@wsp.com

TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

X Standard TAT (List due date):

Non Standard or urgent TAT (List due date):

ALS QUOTE NO.: EN-080-17

COC SEQUENCE NUMBER (Circle)

COC: 1 2 (3) 4 5 6 7

OF: 1 2 3 (4) 5 6 7

FOR LABORATORY USE ONLY (Circle)

Custody seal intact? Yes No N/A

Frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comment: 19-1

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Leila Bowe			
DATE/TIME: ~~24~~ 25/02/21	DATE/TIME: 25/2/21	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE | SAMPLE DETAILS MATRIX: SOLID (S) WATER (W) | CONTAINER INFORMATION | ANALYSIS REQUIRED including SUITES (NB. Suite codes must be listed to ensure correct analysis). Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant.	Hold	Additional Information (Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.)
25	TP06_0.1	24/02/21	S		1				X			
26	TP06_0.5				1	X		X				
27	TP06_1.0				1						X	
28	TP15_0.1				1				X			
29	TP15_0.5				1						X	
30	TP15_1.0				1	X		X				
31	TP09_0.5				2	X		X		X		
32	TP09_0.5 FRAG.				1				X	[illegible]		
33	TP09_1.0				1						X	
34	TP08_0.2				2				X			
35	TP08_0.5				1							
36	TP08_1.0				1	X		[illegible]				
				TOTAL	14	4	0	3	4	1	3	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial; HC = Preserved; VS = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sodium Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

HAIN OF USTODY

ALS laboratory: please tick →

CLIENT: WSP

OFFICE:

PROJECT: PS123745 - EMKG St Marys LSA

ORDER NUMBER:

PROJECT MANAGER: Leila Bowe

SAMPLER: Leila Bowe

COC emailed to ALS? (YES / NO)

Email Reports to (will default to PM if no other addresses are listed): leila.bowe@wsp.com

Email Invoice to (will default to PM if no other addresses are listed): leila.bowe@wsp.com

TURNAROUND REQUIREMENTS: (Surcharges may be charged for urgent TAT requests e.g. Ultra Trace Organics)

☒ Standard TAT (List due date):

☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.: EN-080-17

CONTACT PH: 0468453715

SAMPLER MOBILE: 0468453715

EDD FORMAT (or default): Esdat and PDF

COC SEQUENCE NUMBER (Circle)

COC: 1 2 3 4 5 6 7

C 1 2 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free Ice/ frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on receipt: 19.4 °C

Other comments:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Leila Bowe			
DATE/TIME: 24/02/21	DATE/TIME: 24/2/21 15:15	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)
Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (filtered bottle required).

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant.	Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS						
37	TP07_0.5	24/02/21	S		2	X		X	X		
38	TP07_1.0				2						
39	QA01				1	X		X			
	QA01A				1	X		X			Forward to Eurofins
40	Trip blank				1		X				
41	Trip spike				1		X				
42	BH03_0.7	25/02/21			1				X		
43	BH02_0.5				1	X		X			
44	BH03_0.5				1	X		X			
45	BH02_1.0				1				X		
46	BH04/GW01_0.5	24/02/21			1				X		
47	BH04_0.2				1	X		X			
	TOTAL				2	7	2	2			

Water Container Codes: P = Unpreserved Plastic, N = Nitric Preserved Plastic, ORC = Nitric Preserved ORC, SP = Sodium Hydroxide/Cd Preserved Plastic, B = Sodium Hydroxide Preserved Plastic, AG = Amber Glass Unpreserved, AP = Airfreight Unpreserved Plastic, V = VOA Vial HCl Preserved, VS = VOA Vial Sodium Bisulphate Preserved, VS = VOA Vial Sulfuric Preserved, AV = Airfreight Unpreserved Vial, EG = Sulfuric Preserved Amber Glass, H = HCl preserved Plastic, HS = HCl preserved Speciation bottle, SP = Sulfuric Preserved Plastic, F = Formaldehyde Preserved Glass, Z = Zinc Acetate Preserved Bottle, E = EDTA Preserved Bottle, ST = Sterile Bottle, ASS = Plastic Bag for Acid Sulphate Soils, G = Unpreserved Bag.

48	BH05_0.5	24/02/21			2	X		X	X		
49	TS 6										

Document Set ID: 9858356
Version: 1, Version Date: 17/12/2021

CHAIN OF CUSTODY

ALS Laboratory: please tick

CLIENT: WSP	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☒ Standard TAT (List due date):	**FOR LABORATORY USE ONLY (Circle)**
OFFICE:		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: PS123745 - EMKC St Marys FSA	ALS QUOTE NO.: EN-085-17	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER:		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: 19.1 °C
PROJECT MANAGER: Leila Bowe	CONTACT PH: 0468453715	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: Leila Bowe	SAMPLER MOBILE: 0468453715		
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): Esdat and PDF		
Email Reports to: leila.bowe@wsp.com, colin.mckay@wsp.com			
Email Invoice to (will default to PM if no other addresses are listed): leila.bowe@wsp.com			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Leila Bowe	[signature]		
DATE/TIME: 25/02/21	DATE/TIME: 25/2/21 15:15	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price). Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant.	Hold	Additional Information
1	TPΦ3_0.1	24/02/21	S	Jar/bag / NC QA01A / Envirolab	1				X			
2	TP13_0.5				1	X		X				
3	TP13_3.0				1						X	
4	TP12_0.1				1				X			
5	TP12_0.5				1	X		X				
6	TP12_1.0				1						X	
7	TP11_0.1				1				X			
8	TP11_0.5				1	X		X				
9	TP10_0.1				1				X			
10	TP10_0.5				1						X	
11	TP04_0.1				1				X			
12	TP04_0.5				1	X		X				
TOTAL					12	4	0	4	5		3	

Additional Information: Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.

Environmental Division
Sydney
Work Order Reference
ES2106968

Telephone: +61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: WSP
OFFICE:
PROJECT: PS123745 - EMKC St Marys ESA
ORDER NUMBER:
PROJECT MANAGER: Leila Bowe
SAMPLER: Leila Bowe
COC emailed to ALS? (YES / NO)
Email Reports to: leila.bowe@wsp.com; colin.mckay@wsp.com
Email Invoice to (will default to PM if no other addresses are listed): leila.bowe@wsp.com

CONTACT PH: 0468453715
SAMPLER MOBILE: 0468453715
EDD FORMAT (or default): Esdat and PDF

TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)
ALS QUOTE NO.: EN-085-17

☒ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):

COC SEQUENCE NUMBER (Circle)
COC: 1 (2) 3 4 5 6 7
OF: 1 2 3 (4) 5 6 7

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Leila Bowe	[signature]		
DATE/TIME: 25/02/21	DATE/TIME: 25.02.21 1545	DATE/TIME:	DATE/TIME:

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No (N/A)
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: °C
Other comment: 19.1

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE | SAMPLE DETAILS MATRIX: SOLID (S) WATER (W) | CONTAINER INFORMATION | ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant.	Hold.	Additional Information: Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
13	TP04_WA 2.5	24/02/21	S		1						X	
14	TP05_0.5				2				X			
15	TP05_1.0				1	X		X				
16	TP03_0.5				2	X		X	X			
17	TP14_0.1				1				X			
18	TP14_0.5				1	X		X				
19	TP02_0.1				1				X			
20	TP02_0.5				1						X	
21	TP02_1.0				1	X		X				
22	TP01_0.1				1				X			
23	TP01_0.5				1	X		X				
24	TP01_1.5				1						X	
TOTAL					14	5	0	5	5		3	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VS = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: WSP

OFFICE:

PROJECT: PS127745 - EVAC St Marys ESA

ORDER NUMBER:

PROJECT MANAGER: Leila Bowe | CONTACT PH: 0468453715

SAMPLER: Leila Bowe | SAMPLER MOBILE: 0468453715

COC emailed to ALS? (YES / NO) | EDD FORMAT (or default): Esdat and PDF

Email Reports to: leila.bowe@wsp.com, colin.mckay@wsp.com

Email Invoice to (will default to PM if no other addresses are listed): leila.bowe@wsp.com

TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

X Standard TAT (List due date):

Non Standard or urgent TAT (List due date):

ALS QUOTE NO.: EN-080-17

COC SEQUENCE NUMBER (Circle)

COC: 1 2 (3) 4 5 6 7

OF: 1 2 3 (4) 5 6 7

FOR LABORATORY USE ONLY (Circle)

Custody seal intact? Yes No N/A

Frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comment: 19-1

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Leila Bowe			
DATE/TIME: ~~24~~ 25/02/21	DATE/TIME: 25/2/21	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE | SAMPLE DETAILS MATRIX: SOLID (S) WATER (W) | CONTAINER INFORMATION | ANALYSIS REQUIRED including SUITES (NB. Suite codes must be listed to ensure correct analysis). Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant.	Hold	Additional Information (Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.)
25	TP06_0.1	24/02/21	S		1				X			
26	TP06_0.5				1	X		X				
27	TP06_1.0				1						X	
28	TP15_0.1				1				X			
29	TP15_0.5				1						X	
30	TP15_1.0				1	X		X				
31	TP09_0.5				2	X		X		X		
32	TP09_0.5 FRAG.				1				X	[illegible]		
33	TP09_1.0				1						X	
34	TP08_0.2				2				X			
35	TP08_0.5				1							
36	TP08_1.0				1	X		[illegible]				
				TOTAL	14	4	0	3	4	1	3	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial; HC = Preserved; VS = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sodium Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

HAIN OF USTODY

ALS laboratory: please tick →

CLIENT: WSP

OFFICE:

PROJECT: PS123745 - EMKG St Marys LSA

ORDER NUMBER:

PROJECT MANAGER: Leila Bowe

SAMPLER: Leila Bowe

COC emailed to ALS? (YES / NO)

Email Reports to (will default to PM if no other addresses are listed): leila.bowe@wsp.com

Email Invoice to (will default to PM if no other addresses are listed): leila.bowe@wsp.com

TURNAROUND REQUIREMENTS: (Surcharges may be charged for urgent TAT requests e.g. Ultra Trace Organics)

☒ Standard TAT (List due date):

☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.: EN-080-17

CONTACT PH: 0468453715

SAMPLER MOBILE: 0468453715

EDD FORMAT (or default): Esdat and PDF

COC SEQUENCE NUMBER (Circle)

COC: 1 2 3 4 5 6 7

C 1 2 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free Ice/ frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on receipt: 19.4 °C

Other comments:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Leila Bowe			
DATE/TIME: 24/02/21	DATE/TIME: 24/2/21 15:15	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)
Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (filtered bottle required).

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant.	Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS						
37	TP07_0.5	24/02/21	S		2	X		X	X		
38	TP07_1.0				2						
39	QA01				1	X		X			
	QA01A				1	X		X			Forward to Eurofins
40	Trip blank				1		X				
41	Trip spike				1		X				
42	BH03_0.7	25/02/21			1				X		
43	BH02_0.5				1	X		X			
44	BH03_0.5				1	X		X			
45	BH02_1.0				1				X		
46	BH04/GW01_0.5	24/02/21			1				X		
47	BH04_0.2				1	X		X			
	TOTAL				2	7	2	2			

Water Container Codes: P = Unpreserved Plastic, N = Nitric Preserved Plastic, ORC = Nitric Preserved ORC, SP = Sodium Hydroxide/Cd Preserved Plastic, B = Sodium Hydroxide Preserved Plastic, AG = Amber Glass Unpreserved, AP = Airfreight Unpreserved Plastic, V = VOA Vial HCl Preserved, VS = VOA Vial Sodium Bisulphate Preserved, VS = VOA Vial Sulfuric Preserved, AV = Airfreight Unpreserved Vial, EG = Sulfuric Preserved Amber Glass, H = HCl preserved Plastic, HS = HCl preserved Speciation bottle, SP = Sulfuric Preserved Plastic, F = Formaldehyde Preserved Glass, Z = Zinc Acetate Preserved Bottle, E = EDTA Preserved Bottle, ST = Sterile Bottle, ASS = Plastic Bag for Acid Sulphate Soils, G = Unpreserved Bag.

48	BH05_0.5	24/02/21			2	X		X	X		
49	TS 6										

Document Set ID: 9858356
Version: 1, Version Date: 17/12/2021

5/3

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: WSP	TURNAROUND REQUIREMENTS: ☑ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY (Circle): Custody Seal Intact? Yes No N/A; Cooling Method: Ice Ice Pack None; Cooler Temperature on Receipt: °C; Other Comments:	
OFFICE:			
PROJECT: PS125745 - EMKS St Marys ESA	ALS QUOTE NO.: EN-085-17	COC SEQUENCE NUMBER (Circle): COC 1 2 3 4 5 6 7; SOF 1 2 3 4 5 6 7	
ORDER NUMBER:			
PROJECT MANAGER: Leila Bowe	CONTACT PH: 0468453715		
SAMPLER: Leila Bowe	SAMPLER MOBILE: 0468453715	RELINQUISHED BY: Leila Bowe	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): Esdat and PUF	DATE/TIME: 25/02/21	DATE/TIME: 25/2/21
Email Reports to: leila.bowe@wsp.com; colin.mcavoy@wsp.com			
Email Invoice to: will be sent to PM1 For other addresses are: steve.leila.bowe@wsp.com			

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to the right)						
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant.	Hold	Additional information (Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.)
	TP03_0.1	24/02/21	S						X			
	TP13_0.5				1	X	X					
	TP13_3.0				1						X	
	TP12_0.1				1				X			
	TP12_0.5				1	X	X					
	TP12_1.0				1						X	
	TP11_0.1				1				X			
	TP11_0.5				1	X	X					
	TP10_0.1				1				X			
	TP10_0.5				1						X	
	TP04_0.1				1				X			
	TP04_0.5				1	X	X					
				TOTAL	12	4	4	10	4	1	5	3

Environmental Division Sydney
Work Order Reference
ES2106968

Telephone: 61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial, HCl Preserved; VS = VOA Vial, Sulfuric Preserved; VA = VOA Vial, Sulfuric Preserved, AV = Airfreight Unpreserved Vial; SG = Sulfuric Preserved Amber Glass; H = Unpreserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

A Subcontractor please fax →

CLIENT: WSP
OFFICE:
PROJECT: PS123745 - EMKC St Marys LSA
ORDER NUMBER:
PROJECT MANAGER: Leila Bowe
SAMPLER: Leila Bowe
COC emailed to ALS? (YES / NO)
Email Reports to: leila.bowe@wsp.com, colin.mckay@wsp.com
Email Invoice to (will default to PM if no other addresses are specified): leila.bowe@wsp.com

TURNAROUND REQUIREMENTS:
(standard TAT may be longer for some tests e.g. Dioxins)
☒ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.: EN-085-17
CONTACT PH: 0468453715
SAMPLER MOBILE: 0468453715
EDD FORMAT (or default): Esdat and PDF

COC SEQUENCE NUMBER (Circle)
1 (2) 3 4 5 6 7
0 1 2 3 (4) 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact: Yes No (N/A)
Free ice / frozen ice blocks present upon receipt: Yes No N/A
Random Sample Temperature on Receipt: °C
Cooling Method: Ice

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Leila Bowe			
DATE/TIME: 25/02/21	DATE/TIME: 25/2/21 15:15	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)
Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (filtered bottle required).

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION								
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant.	Hold	Additional Information (Comments on likely contaminant levels, dilutions, or samples requiring special QC analysis etc)
13	TP04_WCA 2.5	24/02/21	S		1						X	
14	TP05_0.5				2				X			
15	TP05_1.0				1	X		X				
16	TP03_0.5				2	X		X	X			
17	TP14_0.1				1				X			
18	TP14_0.5				1	X		X				
19	TP02_0.1				1				X			
20	TP02_0.5				1						X	
21	TP02_1.0				1	X		X				
22	TP01_0.1				1				X			
23	TP01_0.5				1	X		X				
24	TP01_1.5				1						X	
				TOTAL	14	5	0	5	5		3	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VS = VOA Vial Sodium Bisulphate Preserved; VA = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial; SG = Sulfuric Preserved Amber Glass; T = Tedlar Bag; H = HCl preserved Plastic; HS = HCl preserved Speciation Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulfate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory (please tick)

CLIENT: WSP

OFFICE:

PROJECT: PS123745 - EMKC St Marys ESA

ORDER NUMBER:

PROJECT MANAGER: Leila Bowe

CONTACT PH: 0468453715

SAMPLER: Leila Bowe

SAMPLER MOBILE: 0468453715

COC emailed to ALS? (YES / NO)

EDD FORMAT (or default): Esdat and PDF

Email Reports to: leila.bowe@wsp.com, colin.mckay@wsp.com

Email Invoice to (will default to PM if no other addresses are listed): leila.bowe@wsp.com

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

ALS QUOTE NO.: EN-086-17

☒ Standard TAT (List due date):

☐ Non Standard or urgent TAT (List due date):

COC SEQUENCE NUMBER (Circle)

COC: 1 2 (3) 4 5 6 7

OF: 1 2 3 (4) 5 6 7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice blocks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other Comments: 19-1

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Leila Bowe			
DATE/TIME: 25/02/21	DATE/TIME: 25.02.21 15:45	DATE/TIME:	DATE/TIME:

ALS USE

SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)

CONTAINER INFORMATION

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)
Where Metals are required specify Total (unfiltered bottle required) or Dissolved (filtered in field bottle required)

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant	Hold	Additional Information (Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc)
25	TP06_0.1	24/02/21	S		1				X			
26	TP06_0.5				1	X		X				
27	TP06_1.0				1						X	
28	TP15_0.1				1				X			
29	TP15_0.5				1						X	
30	TP15_1.0				1	X		X				
31	TP09_0.5				2	X		X		X		
32	TP09_0.5 FRAG.				1				X	[illegible]		
33	TP09_1.0				1						X	
34	TP08_0.2				2				X			
35	TP08_0.5				1							
36	TP08_1.0				1	X		[illegible]				
				TOTAL	14	4	0	3	4	1	3	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ON = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag

HAIN OF USTODY

ALS Laboratory please tick →

CLIENT: WSP

OFFICE:

PROJECT: PS123745 - EMKO St Marys ESA

ORDER NUMBER:

PROJECT MANAGER: Leila Bowe — CONTACT PH: 0468453715

SAMPLER: Leila Bowe — SAMPLER MOBILE: 0468453715

COC emailed to ALS? (YES / NO) — EDD FORMAT (or default): Esdat and PDF

Email Reports to: leila.bowe@wsp.com, colin.mckay@wsp.com

Email Invoice to (will default to PM if no other addresses are listed): leila.bowe@wsp.com

TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

☒ Standard TAT (List due date):

☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.: EN-085-17

COC SEQUENCE NUMBER (Circle)

COC: 1 2 3 4 5 6 7

CT: 1 2 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free Ice / Frozen (if ice is present upon receipt)? Yes No N/A

Random Sample Temperature on Receipt: 19.1

Other comments:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Leila Bowe			
DATE/TIME: 24/02/21	DATE/TIME: 25/2/21 1545	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE

SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)

CONTAINER INFORMATION

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to the right) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant.
37	TP07_0.5	24/02/21	S		2	X		X	X	
38	TP07_1.0				2					
39	QA01				1	X		X		
	QA01A				1	X		X		
40	Trip blank				1		X			
41	Trip spike				1		X			
42	BH03_0.7	25/02/21			1				X	
43	BH02_0.5				1	X		X		
44	BH03_0.5				1	X		X		
45	BH02_1.0				1				X	
46	BH04/QAW01_0.5	24/02/21			1				X	
47	BH04_0.2				1	X		X		
	TOTAL				2	2	2	2		

Additional Information: Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.

Forward to Eurofin

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ON = Nitric Preserved ORP; SH = Sodium Hydroxide Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial - HCl Preserved; VS = VOA Vial Sodium Bisulphate Preserved; VA = VOA Vial - Sulfuric Preserved; AV = Airfreight Unpreserved Vial; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag

48 BH05_0.5 24/02/21

49 TS 50. BH01_0.2m 51. BH01_0.5m

Helen Simpson

From: Bowe, Leila <Leila.Bowe@wsp.com>
Sent: Monday, 1 March 2021 12:15 PM
To: Helen Simpson
Subject: [EXTERNAL] - Re: ALS Workorder ES2106968, Client PARBRINSW, Project PS123745 - EMKC ST MARYS ESA

Hey Helen,

Please change the first 3 as per the assumed depths.

Are you able to analyse BH01_0.2 for TRH/BTEXN, PAHs and 8 metals please (as per other jars - no OCP/OPPs)?

Let me know if any other issues.

Thanks,
Leila

Get Outlook for Android

From: Helen Simpson <helen.simpson@alsglobal.com>
Sent: Monday, March 1, 2021 10:42:37 AM
To: Bowe, Leila <Leila.Bowe@wsp.com>
Subject: ALS Workorder ES2106968, Client PARBRINSW, Project PS123745 - EMKC ST MARYS ESA

Hi Leila,

For the attached COC, please note/clarify the following ID issues:

1. Sample 28, TP15_0.1 – bag received labelled with TP15_ 1.0 – assuming correct depth should be 0.1?
2. Sample 17, TP14_0.1 – bag received labelled with TP14_0.5 – assuming correct depth should be 0.1?
3. Sample 48, BH02_0.5 – jar received labelled with BH02_0.3 – assuming correct depth should be 0.5? (the bag was labelled correctly as BH02_0.5)
4. 2 extra samples received and placed on hold:
    a. BH01_0.2 jar dated 26/2/21

b. BH01_0.5 jar and bag dated 26/2/21

Kind Regards,

Helen Simpson
Sample Admin, Environmental
Sydney

T +61 2 8784 8555
F +61 2 8784 8500
helen.simpson@alsglobal.com
277-289 Woodpark Road
Smithfield NSW 2164 AUSTRALIA

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Recent releases (click to access directly):
EnviroMail™ 127 – Bacterial Diversity Profiling in NGS
EnviroMail™ 128 – Revised PFAS Bottle Requirements

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www.alsglobal.com

5/3

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: WSP	TURNAROUND REQUIREMENTS: ☑ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY (Circle): Custody Seal Intact? Yes No N/A; Cooling Method: Ice Ice Pack None; Cooler Temperature on Receipt: °C; Other Comments:	
OFFICE:			
PROJECT: PS125745 - EMKS St Marys ESA	ALS QUOTE NO.: EN-085-17	COC SEQUENCE NUMBER (Circle): COC 1 2 3 4 5 6 7; SOF 1 2 3 4 5 6 7	
ORDER NUMBER:			
PROJECT MANAGER: Leila Bowe	CONTACT PH: 0468453715		
SAMPLER: Leila Bowe	SAMPLER MOBILE: 0468453715	RELINQUISHED BY: Leila Bowe	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): Esdat and PUF	DATE/TIME: 25/02/21	DATE/TIME: 25/2/21
Email Reports to: leila.bowe@wsp.com; colin.mcavoy@wsp.com			
Email Invoice to: will be sent to PM1 For other addresses are: steve.leila.bowe@wsp.com			

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to the right)						
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant.	Hold	Additional information (Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.)
	TP03_0.1	24/02/21	S						X			
	TP13_0.5				1	X	X					
	TP13_3.0				1						X	
	TP12_0.1				1				X			
	TP12_0.5				1	X	X					
	TP12_1.0				1						X	
	TP11_0.1				1				X			
	TP11_0.5				1	X	X					
	TP10_0.1				1				X			
	TP10_0.5				1						X	
	TP04_0.1				1				X			
	TP04_0.5				1	X	X					
				TOTAL	12	4	4	10	4	1	5	3

Environmental Division Sydney
Work Order Reference
ES2106968

Telephone: 61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial, HCl Preserved; VS = VOA Vial, Sulfuric Preserved; VA = VOA Vial, Sulfuric Preserved, AV = Airfreight Unpreserved Vial; SG = Sulfuric Preserved Amber Glass; H = Unpreserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

A Subcontractor please fax →

CLIENT: WSP
OFFICE:
PROJECT: PS123745 - EMKC St Marys LSA
ORDER NUMBER:
PROJECT MANAGER: Leila Bowe
SAMPLER: Leila Bowe
COC emailed to ALS? (YES / NO)
Email Reports to: leila.bowe@wsp.com, colin.mckay@wsp.com
Email Invoice to (will default to PM if no other addresses are specified): leila.bowe@wsp.com

TURNAROUND REQUIREMENTS:
(standard TAT may be longer for some tests e.g. Dioxins)
☒ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.: EN-085-17
CONTACT PH: 0468453715
SAMPLER MOBILE: 0468453715
EDD FORMAT (or default): Esdat and PDF

COC SEQUENCE NUMBER (Circle)
1 (2) 3 4 5 6 7
0 1 2 3 (4) 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact: Yes No (N/A)
Free ice / frozen ice blocks present upon receipt: Yes No N/A
Random Sample Temperature on Receipt: °C
Cooling Method: Ice

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Leila Bowe			
DATE/TIME: 25/02/21	DATE/TIME: 25/2/21 15:15	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)
Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (filtered bottle required).

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION								
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant.	Hold	Additional Information (Comments on likely contaminant levels, dilutions, or samples requiring special QC analysis etc)
13	TP04_WCA 2.5	24/02/21	S		1						X	
14	TP05_0.5				2				X			
15	TP05_1.0				1	X		X				
16	TP03_0.5				2	X		X	X			
17	TP14_0.1				1				X			
18	TP14_0.5				1	X		X				
19	TP02_0.1				1				X			
20	TP02_0.5				1						X	
21	TP02_1.0				1	X		X				
22	TP01_0.1				1				X			
23	TP01_0.5				1	X		X				
24	TP01_1.5				1						X	
				TOTAL	14	5	0	5	5		3	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VS = VOA Vial Sodium Bisulphate Preserved; VA = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial; SG = Sulfuric Preserved Amber Glass; T = Tedlar Bag; H = HCl preserved Plastic; HS = HCl preserved Speciation Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulfate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory (please tick)

CLIENT: WSP

OFFICE:

PROJECT: PS123745 - EMKC St Marys ESA

ORDER NUMBER:

PROJECT MANAGER: Leila Bowe

CONTACT PH: 0468453715

SAMPLER: Leila Bowe

SAMPLER MOBILE: 0468453715

COC emailed to ALS? (YES / NO)

EDD FORMAT (or default): Esdat and PDF

Email Reports to: leila.bowe@wsp.com, colin.mckay@wsp.com

Email Invoice to (will default to PM if no other addresses are listed): leila.bowe@wsp.com

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

ALS QUOTE NO.: EN-086-17

☒ Standard TAT (List due date):

☐ Non Standard or urgent TAT (List due date):

COC SEQUENCE NUMBER (Circle)

COC: 1 2 (3) 4 5 6 7

OF: 1 2 3 (4) 5 6 7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice blocks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other Comments: 19-1

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Leila Bowe			
DATE/TIME: 25/02/21	DATE/TIME: 25.02.21 15:45	DATE/TIME:	DATE/TIME:

ALS USE

SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)

CONTAINER INFORMATION

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)
Where Metals are required specify Total (unfiltered bottle required) or Dissolved (filtered in field bottle required)

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant	Hold	Additional Information (Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc)
25	TP06_0.1	24/02/21	S		1				X			
26	TP06_0.5				1	X		X				
27	TP06_1.0				1						X	
28	TP15_0.1				1				X			
29	TP15_0.5				1						X	
30	TP15_1.0				1	X		X				
31	TP09_0.5				2	X		X		X		
32	TP09_0.5 FRAG.				1				X	[illegible]		
33	TP09_1.0				1						X	
34	TP08_0.2				2				X			
35	TP08_0.5				1							
36	TP08_1.0				1	X		[illegible]				
				TOTAL	14	4	0	3	4	1	3	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ON = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag

HAIN OF USTODY

ALS Laboratory please tick →

CLIENT: WSP

OFFICE:

PROJECT: PS123745 - EMKO St Marys ESA

ORDER NUMBER:

PROJECT MANAGER: Leila Bowe — CONTACT PH: 0468453715

SAMPLER: Leila Bowe — SAMPLER MOBILE: 0468453715

COC emailed to ALS? (YES / NO) — EDD FORMAT (or default): Esdat and PDF

Email Reports to: leila.bowe@wsp.com, colin.mckay@wsp.com

Email Invoice to (will default to PM if no other addresses are listed): leila.bowe@wsp.com

TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

☒ Standard TAT (List due date):

☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.: EN-085-17

COC SEQUENCE NUMBER (Circle)

COC: 1 2 3 4 5 6 7

CT: 1 2 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free Ice / Frozen (if ice is present upon receipt)? Yes No N/A

Random Sample Temperature on Receipt: 19.1

Other comments:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Leila Bowe			
DATE/TIME: 24/02/21	DATE/TIME: 25/2/21 1545	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE

SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)

CONTAINER INFORMATION

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to the right) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant.
37	TP07_0.5	24/02/21	S		2	X		X	X	
38	TP07_1.0				2					
39	QA01				1	X		X		
	QA01A				1	X		X		
40	Trip blank				1		X			
41	Trip spike				1		X			
42	BH03_0.7	25/02/21			1				X	
43	BH02_0.5				1	X		X		
44	BH03_0.5				1	X		X		
45	BH02_1.0				1				X	
46	BH04/QAW01_0.5	24/02/21			1				X	
47	BH04_0.2				1	X		X		
	TOTAL				2	2	2	2		

Additional Information: Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.

Forward to Eurofin

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ON = Nitric Preserved ORP; SH = Sodium Hydroxide Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial - HCl Preserved; VS = VOA Vial Sodium Bisulphate Preserved; VA = VOA Vial - Sulfuric Preserved; AV = Airfreight Unpreserved Vial; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag

48 BH05_0.5 24/02/21

49 TS 50. BH01_0.2m 51. BH01_0.5m

Helen Simpson

From: Bowe, Leila <Leila.Bowe@wsp.com>
Sent: Monday, 1 March 2021 12:15 PM
To: Helen Simpson
Subject: [EXTERNAL] - Re: ALS Workorder ES2106968, Client PARBRINSW, Project PS123745 - EMKC ST MARYS ESA

Hey Helen,

Please change the first 3 as per the assumed depths.

Are you able to analyse BH01_0.2 for TRH/BTEXN, PAHs and 8 metals please (as per other jars - no OCP/OPPs)?

Let me know if any other issues.

Thanks,
Leila

Get Outlook for Android

From: Helen Simpson <helen.simpson@alsglobal.com>
Sent: Monday, March 1, 2021 10:42:37 AM
To: Bowe, Leila <Leila.Bowe@wsp.com>
Subject: ALS Workorder ES2106968, Client PARBRINSW, Project PS123745 - EMKC ST MARYS ESA

Hi Leila,

For the attached COC, please note/clarify the following ID issues:

1. Sample 28, TP15_0.1 – bag received labelled with TP15_ 1.0 – assuming correct depth should be 0.1?
2. Sample 17, TP14_0.1 – bag received labelled with TP14_0.5 – assuming correct depth should be 0.1?
3. Sample 48, BH02_0.5 – jar received labelled with BH02_0.3 – assuming correct depth should be 0.5? (the bag was labelled correctly as BH02_0.5)
4. 2 extra samples received and placed on hold:
    a. BH01_0.2 jar dated 26/2/21

b. BH01_0.5 jar and bag dated 26/2/21

Kind Regards,

Helen Simpson
Sample Admin, Environmental
Sydney

T +61 2 8784 8555
F +61 2 8784 8500
helen.simpson@alsglobal.com
277-289 Woodpark Road
Smithfield NSW 2164 AUSTRALIA

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EnviroMail™ 128 – Revised PFAS Bottle Requirements

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ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2107291**	Page	: 1 of 8
Client	: **WSP Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: Leila Bowe	Contact	: Brenda Hong
Address	: ABN: 80 078 004 798 GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: PS123745 - EMKC ST MARYS ESA	Date Samples Received	: 02-Mar-2021 12:20
Order number	: ----	Date Analysis Commenced	: 05-Mar-2021
C-O-C number	: ----	Issue Date	: 09-Mar-2021 15:34
Sampler	: Leila Bowe		
Site	: ----		
Quote number	: EN/085/17		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

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

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

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

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

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

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

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for TEQ ero are treated as zero.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- 4-Methylphenol at or above the LOR.
- EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEXN compounds spiked at 20 ug/L.

Sub-Matrix: WATER
(Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	GW01	GW02	GW03	QA01	Trip Blank
				Sampling date / time	01-Mar-2021 00:00	01-Mar-2021 00:00	01-Mar-2021 00:00	01-Mar-2021 00:00	01-Mar-2021 00:00
					ES2107291-001	ES2107291-002	ES2107291-003	ES2107291-004	ES2107291-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		**0.001**	<0.001	<0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L		**0.0005**	**0.0007**	**0.0002**	**0.0002**	----
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L		**0.051**	**0.145**	**0.029**	**0.029**	----
Lead	7439-92-1	0.001	mg/L		**0.002**	**0.002**	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L		**0.087**	**0.129**	**0.183**	**0.183**	----
Zinc	7440-66-6	0.005	mg/L		**0.198**	**0.180**	**0.441**	**0.445**	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
beta-BHC	319-85-7	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
gamma-BHC	58-89-9	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
delta-BHC	319-86-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Heptachlor	76-44-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Aldrin	309-00-2	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Heptachlor epoxide	1024-57-3	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
trans-Chlordane	5103-74-2	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
alpha-Endosulfan	959-98-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
cis-Chlordane	5103-71-9	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Dieldrin	60-57-1	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
4.4`-DDE	72-55-9	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Endrin	72-20-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
beta-Endosulfan	33213-65-9	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
4.4`-DDD	72-54-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Endrin aldehyde	7421-93-4	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Endosulfan sulfate	1031-07-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
4.4`-DDT	50-29-3	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	----
Endrin ketone	53494-70-5	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Methoxychlor	72-43-5	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	----
Total Chlordane (sum)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----

Sub-Matrix: WATER
(Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	GW01	GW02	GW03	QA01	Trip Blank
				Sampling date / time	01-Mar-2021 00:00	01-Mar-2021 00:00	01-Mar-2021 00:00	01-Mar-2021 00:00	01-Mar-2021 00:00
					ES2107291-001	ES2107291-002	ES2107291-003	ES2107291-004	ES2107291-005
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Demeton-S-methyl	919-86-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Monocrotophos	6923-22-4	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	----
Dimethoate	60-51-5	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Diazinon	333-41-5	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Parathion-methyl	298-00-0	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	----
Malathion	121-75-5	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Fenthion	55-38-9	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Chlorpyrifos	2921-88-2	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Parathion	56-38-2	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	----
Pirimphos-ethyl	23505-41-1	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Chlorfenvinphos	470-90-6	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Bromophos-ethyl	4824-78-6	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Fenamiphos	22224-92-6	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Prothiofos	34643-46-4	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Ethion	563-12-2	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Carbophenothion	786-19-6	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Azinphos Methyl	86-50-0	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Acenaphthene	83-32-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Fluorene	86-73-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Phenanthrene	85-01-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Anthracene	120-12-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Fluoranthene	206-44-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Pyrene	129-00-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Chrysene	218-01-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----

Sub-Matrix: WATER
(Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	GW01	GW02	GW03	QA01	Trip Blank
				Sampling date / time	01-Mar-2021 00:00	01-Mar-2021 00:00	01-Mar-2021 00:00	01-Mar-2021 00:00	01-Mar-2021 00:00
					ES2107291-001	ES2107291-002	ES2107291-003	ES2107291-004	ES2107291-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	µg/L		**170**	<100	<100	<100	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	----
C10 - C36 Fraction (sum)	----	50	µg/L		**170**	<50	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	<20
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	<100	----
>C16 - C34 Fraction	----	100	µg/L		**120**	<100	<100	<100	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	----
>C10 - C40 Fraction (sum)	----	100	µg/L		**120**	<100	<100	<100	----
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
Total Xylenes	----	2	µg/L		<2	<2	<2	<2	<2
Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.5	%		**70.1**	**76.2**	**70.8**	**74.2**	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.5	%		**88.6**	**94.6**	**82.2**	**80.2**	----

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	GW01	GW02	GW03	QA01	Trip Blank
				Sampling date / time	01-Mar-2021 00:00	01-Mar-2021 00:00	01-Mar-2021 00:00	01-Mar-2021 00:00	01-Mar-2021 00:00
Compound	CAS Number	LOR	Unit		ES2107291-001	ES2107291-002	ES2107291-003	ES2107291-004	ES2107291-005
					Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		22.8	22.9	26.1	25.6	----
2-Chlorophenol-D4	93951-73-6	1.0	%		54.3	56.8	41.0	41.2	----
2.4.6-Tribromophenol	118-79-6	1.0	%		63.6	74.6	54.7	62.0	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		54.3	55.9	50.0	52.1	----
Anthracene-d10	1719-06-8	1.0	%		74.0	73.9	66.8	65.9	----
4-Terphenyl-d14	1718-51-0	1.0	%		80.6	85.3	72.0	74.7	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		91.0	82.9	92.7	83.8	86.4
Toluene-D8	2037-26-5	2	%		112	102	121	104	101
4-Bromofluorobenzene	460-00-4	2	%		105	97.8	115	99.3	98.6

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	Trip Spike 9	Trip Spike 10	----	----	----
			Sampling date / time	01-Mar-2021 00:00	01-Mar-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2107291-006	ES2107291-007	--------	--------	--------
				Result	Result	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	**16**	**16**	----	----	----
Toluene	108-88-3	2	µg/L	**16**	**15**	----	----	----
Ethylbenzene	100-41-4	2	µg/L	**16**	**15**	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	**16**	**15**	----	----	----
ortho-Xylene	95-47-6	2	µg/L	**17**	**16**	----	----	----
Total Xylenes	----	2	µg/L	**33**	**31**	----	----	----
Sum of BTEX	----	1	µg/L	**81**	**77**	----	----	----
Naphthalene	91-20-3	5	µg/L	**18**	**19**	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**88.0**	**101**	----	----	----
Toluene-D8	2037-26-5	2	%	**104**	**98.5**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	**103**	**101**	----	----	----

Sub-Matrix: **WATER**

Compound	*CAS Number*	%	
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	67	111
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	67	111
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

QUALITY CONTROL REPORT

Work Order	: **ES2107291**	Page	: 1 of 7
Client	: **WSP Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: Leila Bowe	Contact	: Brenda Hong
Address	: ABN: 80 078 004 798 GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: PS123745 - EMKC ST MARYS ESA	Date Samples Received	: 02-Mar-2021
Order number	: ----	Date Analysis Commenced	: 05-Mar-2021
C-O-C number	: ----	Issue Date	: 09-Mar-2021
Sampler	: Leila Bowe		
Site	: ----		
Quote number	: EN/085/17		
No. of samples received	: 7		
No. of samples analysed	: 7		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

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

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

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

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

Sub-Matrix: **WATER**

EG020F: Dissolved Metals by ICP-MS (QC Lot: 3549642)									
ES2107258-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0010	<0.0010	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.010	<0.010	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.010	<0.010	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.010	<0.010	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.010	<0.010	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.010	<0.010	0.00	No Limit
		EG020A-F: □inc	7440-66-6	0.005	mg/L	<0.050	<0.050	0.00	No Limit
ES2107532-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.003	0.003	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: □inc	7440-66-6	0.005	mg/L	0.014	0.006	88.3	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 3549643)									
ES2107258-002	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
ES2107532-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3546296)									
ES2107291-002	GW02	EP080: C6 - C9 Fraction	----	20	□g/L	<20	<20	0.00	No Limit
ES2107296-021	Anonymous	EP080: C6 - C9 Fraction	----	20	□g/L	<0.02 mg/L	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3546296)									
ES2107291-002	GW02	EP080: C6 - C10 Fraction	C6□C10	20	□g/L	<20	<20	0.00	No Limit
ES2107296-021	Anonymous	EP080: C6 - C10 Fraction	C6□C10	20	□g/L	<0.02 mg/L	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 3546296)									

Sub-Matrix: **WATER**

EP080: BTEXN (QC Lot: 3546296) - continued									
ES2107291-002	GW02	EP080: Benzene	71-43-2	1	g/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	g/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	g/L	<2	<2	0.00	No Limit
		EP080: meta- para-Xylene	108-38-3 106-42-3	2	g/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	g/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	g/L	<5	<5	0.00	No Limit
ES2107296-021	Anonymous	EP080: Benzene	71-43-2	1	g/L	<0.001 mg/L	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	g/L	<0.002 mg/L	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	g/L	<0.002 mg/L	<2	0.00	No Limit
		EP080: meta- para-Xylene	108-38-3 106-42-3	2	g/L	<0.002 mg/L	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	g/L	<0.002 mg/L	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	g/L	<0.005 mg/L	<5	0.00	No Limit

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

Sub-Matrix: **WATER**

EG020F: Dissolved Metals by ICP-MS (QCLot: 3549642)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	102	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	102	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	101	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	101	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	99.2	83.0	111
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	100	82.0	112
EG020A-F: □inc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	99.5	81.0	117
EG035F: Dissolved Mercury by FIMS (QCLot: 3549643)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	96.3	83.0	105
EP068A: Organochlorine Pesticides (OC) (QCLot: 3544603)								
EP068: alpha-BHC	319-84-6	0.5	□g/L	<0.5	5 □g/L	77.3	64.9	107
EP068: Hexachlorobenzene (HCB)	118-74-1	0.5	□g/L	<0.5	5 □g/L	78.1	58.3	111
EP068: beta-BHC	319-85-7	0.5	□g/L	<0.5	5 □g/L	76.5	69.0	117
EP068: gamma-BHC	58-89-9	0.5	□g/L	<0.5	5 □g/L	81.0	70.0	112
EP068: delta-BHC	319-86-8	0.5	□g/L	<0.5	5 □g/L	83.4	68.9	110
EP068: Heptachlor	76-44-8	0.5	□g/L	<0.5	5 □g/L	88.5	65.2	108
EP068: Aldrin	309-00-2	0.5	□g/L	<0.5	5 □g/L	77.0	65.8	109
EP068: Heptachlor epoxide	1024-57-3	0.5	□g/L	<0.5	5 □g/L	80.2	67.1	107
EP068: trans-Chlordane	5103-74-2	0.5	□g/L	<0.5	5 □g/L	80.5	64.1	110
EP068: alpha-Endosulfan	959-98-8	0.5	□g/L	<0.5	5 □g/L	78.6	66.7	112
EP068: cis-Chlordane	5103-71-9	0.5	□g/L	<0.5	5 □g/L	79.4	63.2	111
EP068: Dieldrin	60-57-1	0.5	□g/L	<0.5	5 □g/L	82.3	65.2	113
EP068: 4.4□DDE	72-55-9	0.5	□g/L	<0.5	5 □g/L	82.4	66.0	112
EP068: Endrin	72-20-8	0.5	□g/L	<0.5	5 □g/L	80.4	65.2	113
EP068: beta-Endosulfan	33213-65-9	0.5	□g/L	<0.5	5 □g/L	85.1	67.3	114
EP068: 4.4□DDD	72-54-8	0.5	□g/L	<0.5	5 □g/L	81.4	72.0	122
EP068: Endrin aldehyde	7421-93-4	0.5	□g/L	<0.5	5 □g/L	84.3	66.9	109
EP068: Endosulfan sulfate	1031-07-8	0.5	□g/L	<0.5	5 □g/L	90.2	65.2	112
EP068: 4.4□DDT	50-29-3	2	□g/L	<2.0	5 □g/L	88.8	65.2	112
EP068: Endrin ketone	53494-70-5	0.5	□g/L	<0.5	5 □g/L	78.4	63.8	110
EP068: Methoxychlor	72-43-5	2	□g/L	<2.0	5 □g/L	80.1	61.1	114
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3544603)								
EP068: Dichlorvos	62-73-7	0.5	□g/L	<0.5	5 □g/L	81.0	65.6	114
EP068: Demeton-S-methyl	919-86-8	0.5	□g/L	<0.5	5 □g/L	107	63.7	113

Sub-Matrix: **WATER**

EP068B: Organophosphorus Pesticides (OP) (QCLot: 3544603) - continued								
EP068: Monocrotophos	6923-22-4	2	g/L	<2.0	5 g/L	23.6	19.7	48.0
EP068: Dimethoate	60-51-5	0.5	g/L	<0.5	5 g/L	105	69.5	110
EP068: Diazinon	333-41-5	0.5	g/L	<0.5	5 g/L	79.1	71.1	110
EP068: Chlorpyrifos-methyl	5598-13-0	0.5	g/L	<0.5	5 g/L	81.9	77.0	119
EP068: Parathion-methyl	298-00-0	2	g/L	<2.0	5 g/L	85.5	70.0	124
EP068: Malathion	121-75-5	0.5	g/L	<0.5	5 g/L	99.7	68.4	116
EP068: Fenthion	55-38-9	0.5	g/L	<0.5	5 g/L	86.1	68.6	112
EP068: Chlorpyrifos	2921-88-2	0.5	g/L	<0.5	5 g/L	83.2	75.0	119
EP068: Parathion	56-38-2	2	g/L	<2.0	5 g/L	80.2	67.0	121
EP068: Pirimphos-ethyl	23505-41-1	0.5	g/L	<0.5	5 g/L	80.5	69.0	121
EP068: Chlorfenvinphos	470-90-6	0.5	g/L	<0.5	5 g/L	96.9	71.8	110
EP068: Bromophos-ethyl	4824-78-6	0.5	g/L	<0.5	5 g/L	81.1	67.5	112
EP068: Fenamiphos	22224-92-6	0.5	g/L	<0.5	5 g/L	99.2	64.1	116
EP068: Prothiofos	34643-46-4	0.5	g/L	<0.5	5 g/L	80.8	67.8	114
EP068: Ethion	563-12-2	0.5	g/L	<0.5	5 g/L	83.9	74.0	120
EP068: Carbophenothion	786-19-6	0.5	g/L	<0.5	5 g/L	82.7	66.2	114
EP068: Azinphos Methyl	86-50-0	0.5	g/L	<0.5	5 g/L	87.6	51.6	128
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3544601)								
EP075(SIM): Naphthalene	91-20-3	1	g/L	<1.0	5 g/L	74.6	50.0	94.0
EP075(SIM): Acenaphthylene	208-96-8	1	g/L	<1.0	5 g/L	71.2	63.6	114
EP075(SIM): Acenaphthene	83-32-9	1	g/L	<1.0	5 g/L	71.6	62.2	113
EP075(SIM): Fluorene	86-73-7	1	g/L	<1.0	5 g/L	75.2	63.9	115
EP075(SIM): Phenanthrene	85-01-8	1	g/L	<1.0	5 g/L	78.7	62.6	116
EP075(SIM): Anthracene	120-12-7	1	g/L	<1.0	5 g/L	77.6	64.3	116
EP075(SIM): Fluoranthene	206-44-0	1	g/L	<1.0	5 g/L	81.8	63.6	118
EP075(SIM): Pyrene	129-00-0	1	g/L	<1.0	5 g/L	82.9	63.1	118
EP075(SIM): Benz(a)anthracene	56-55-3	1	g/L	<1.0	5 g/L	84.0	64.1	117
EP075(SIM): Chrysene	218-01-9	1	g/L	<1.0	5 g/L	77.7	62.5	116
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	g/L	<1.0	5 g/L	86.9	61.7	119
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	g/L	<1.0	5 g/L	74.8	63.0	115
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	g/L	<0.5	5 g/L	81.6	63.3	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	g/L	<1.0	5 g/L	83.2	59.9	118
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	g/L	<1.0	5 g/L	84.5	61.2	117
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	g/L	<1.0	5 g/L	85.6	59.1	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3544602)								
EP071: C10 - C14 Fraction	----	50	g/L	<50	400 g/L	89.9	55.8	112
EP071: C15 - C28 Fraction	----	100	g/L	<100	600 g/L	94.2	71.6	113
EP071: C29 - C36 Fraction	----	50	g/L	<50	400 g/L	105	56.0	121

Sub-Matrix: **WATER**

EP080/071: Total Petroleum Hydrocarbons (QCLot: 3546296)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	83.7	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3544602)								
EP071: C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	75.3	57.9	119
EP071: C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	83.0	62.5	110
EP071: C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	94.3	61.5	121
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3546296)								
EP080: C6 - C10 Fraction	C6 C10	20	µg/L	<20	310 µg/L	85.1	75.0	127
EP080: BTEXN (QCLot: 3546296)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	89.0	70.0	122
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	98.6	69.0	123
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	99.8	70.0	120
EP080: meta- para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	98.4	69.0	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	105	72.0	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	102	70.0	120

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

EG020F: Dissolved Metals by ICP-MS (QCLot: 3549642)							
ES2107258-001	Anonymous	EG020A-F: Arsenic	7440-38-2	10 mg/L	101	70.0	130
		EG020A-F: Cadmium	7440-43-9	2.5 mg/L	98.3	70.0	130
		EG020A-F: Chromium	7440-47-3	10 mg/L	91.8	70.0	130
		EG020A-F: Copper	7440-50-8	10 mg/L	93.1	70.0	130
		EG020A-F: Lead	7439-92-1	10 mg/L	88.2	70.0	130
		EG020A-F: Nickel	7440-02-0	10 mg/L	96.0	70.0	130
		EG020A-F: inc	7440-66-6	10 mg/L	96.7	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 3549643)							
ES2107258-001	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	86.9	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3546296)							
ES2107291-002	GW02	EP080: C6 - C9 Fraction	----	325 µg/L	110	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3546296)							
ES2107291-002	GW02	EP080: C6 - C10 Fraction	C6 C10	375 µg/L	109	70.0	130

Sub-Matrix: **WATER**

EP080: BTEXN (QCLot: 3546296)							
ES2107291-002	GW02	EP080: Benzene	71-43-2	25 µg/L	88.4	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	98.7	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	102	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	101	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	103	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	95.3	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2107291**	Page	: 1 of 5
Client	: **WSP Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: Leila Bowe	Telephone	: +61 2 8784 8555
Project	: PS123745 - EMKC ST MARYS ESA	Date Samples Received	: 02-Mar-2021
Site	: ----	Issue Date	: 09-Mar-2021
Sampler	: Leila Bowe	No. of samples received	: 7
Order number	: ----	No. of samples analysed	: 7

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

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

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

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

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- **Quality Control Sample Fre□uency Outliers exist - please see following pages for full details.**

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	12	0.00	10.00	NEPM 2013 B3 □ ALS QC Standard
Pesticides by GCMS	0	5	0.00	10.00	NEPM 2013 B3 □ ALS QC Standard
TRH - Semivolatile Fraction	0	18	0.00	10.00	NEPM 2013 B3 □ ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	12	0.00	5.00	NEPM 2013 B3 □ ALS QC Standard
Pesticides by GCMS	0	5	0.00	5.00	NEPM 2013 B3 □ ALS QC Standard
TRH - Semivolatile Fraction	0	18	0.00	5.00	NEPM 2013 B3 □ ALS QC Standard

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days □ other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for □□ □□ □□□□ vary according to analytes of interest. □inyl Chloride and Styrene holding time is 7 days□ others 14 days. A recorded breach does not guarantee a breach for all □OC analytes and should be verified in case the reported breach is a false positive or □inyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER** Evaluation: □ = Holding time breach □□ = Within holding time.

□ □□□□□ / □□□ □□ □Client Sample ID(s)		□ □ □ □ □ □□	Extraction / Preparation □ □□ □□□ □□□□	Extraction / Preparation Due for extraction	Extraction / Preparation Evaluation	Analysis □ □□ □ □□□□	Analysis Due for analysis	Analysis Evaluation
EG020F: Dissolved Metals by ICP-MS								
Clear Plastic Bottle - Nitric Acid□Filtered (EG020A-F)								
GW01, GW03,	GW02, QA01	**01-Mar-2021**	**----**	----	----	**07-Mar-2021**	28-Aug-2021	Π
EG035F: Dissolved Mercury by FIMS								
Clear Plastic Bottle - Nitric Acid□Filtered (EG035F)								
GW01, GW03,	GW02, QA01	**01-Mar-2021**	**----**	----	----	**08-Mar-2021**	29-Mar-2021	Π
EP068A: Organochlorine Pesticides (OC)								
Amber Glass Bottle - Unpreserved (EP068)								
GW01, GW03,	GW02, QA01	**01-Mar-2021**	**05-Mar-2021**	08-Mar-2021	Π	**08-Mar-2021**	14-Apr-2021	Π
EP068B: Organophosphorus Pesticides (OP)								
Amber Glass Bottle - Unpreserved (EP068)								
GW01, GW03,	GW02, QA01	**01-Mar-2021**	**05-Mar-2021**	08-Mar-2021	Π	**08-Mar-2021**	14-Apr-2021	Π
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Amber Glass Bottle - Unpreserved (EP075(SIM))								
GW01, GW03,	GW02, QA01	**01-Mar-2021**	**05-Mar-2021**	08-Mar-2021	Π	**05-Mar-2021**	14-Apr-2021	Π

Matrix: **WATER**

Evaluation: □ = Holding time breach ; □ = Within holding time.

		Extraction / Preparation			Analysis		
Client Sample ID(s)			Due for extraction	Evaluation		Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
GW01,	GW02,	**01-Mar-2021**	**05-Mar-2021**	08-Mar-2021	✓	**08-Mar-2021**	14-Apr-2021	✓
GW03,	QA01						
Amber VOC Vial - Sulfuric Acid (EP080)							
GW01,	GW02,	**01-Mar-2021**	**05-Mar-2021**	15-Mar-2021	✓	**05-Mar-2021**	15-Mar-2021	✓
GW03,	QA01,						
Trip Blank							
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071)							
GW01,	GW02,	**01-Mar-2021**	**05-Mar-2021**	08-Mar-2021	✓	**08-Mar-2021**	14-Apr-2021	✓
GW03,	QA01						
Amber VOC Vial - Sulfuric Acid (EP080)							
GW01,	GW02,	**01-Mar-2021**	**05-Mar-2021**	15-Mar-2021	✓	**05-Mar-2021**	15-Mar-2021	✓
GW03,	QA01,						
Trip Blank							
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080)							
GW01,	GW02,	**01-Mar-2021**	**05-Mar-2021**	15-Mar-2021	✓	**05-Mar-2021**	15-Mar-2021	✓
GW03,	QA01,						
Trip Blank,	Trip Spike 9,						
Trip Spike 10							

Qu ity ont o P mete F equency omp i nce

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: û = Quality Control frequency not within specification ; ü = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	□□□	Expec □d	*Evaluation*	
Laboratory Duplicates (DUP)							
Dissolved Mercury by FIMS	EG035F	2	17	**11.76**	**10.00**	ü	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	16	**12.50**	**10.00**	ü	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	12	**0.00**	**10.00**	û	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	0	5	**0.00**	**10.00**	û	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	18	**0.00**	**10.00**	û	NEPM 2013 B3 & ALS QC Standard
TRH □olatiles/BTEX	EP080	2	20	**10.00**	**10.00**	ü	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	17	**5.88**	**5.00**	ü	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	**6.25**	**5.00**	ü	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	12	**8.33**	**5.00**	ü	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	5	**20.00**	**5.00**	ü	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	**5.56**	**5.00**	ü	NEPM 2013 B3 & ALS QC Standard
TRH □olatiles/BTEX	EP080	1	20	**5.00**	**5.00**	ü	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	17	**5.88**	**5.00**	ü	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	**6.25**	**5.00**	ü	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	12	**8.33**	**5.00**	ü	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	5	**20.00**	**5.00**	ü	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	**5.56**	**5.00**	ü	NEPM 2013 B3 & ALS QC Standard
TRH □olatiles/BTEX	EP080	1	20	**5.00**	**5.00**	ü	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	17	**5.88**	**5.00**	ü	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	**6.25**	**5.00**	ü	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	12	**0.00**	**5.00**	û	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	0	5	**0.00**	**5.00**	û	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	18	**0.00**	**5.00**	û	NEPM 2013 B3 & ALS QC Standard
TRH □olatiles/BTEX	EP080	1	20	**5.00**	**5.00**	ü	NEPM 2013 B3 & ALS QC Standard

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125 USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45 m filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold apour generation) AAS) Samples are 0.45 m filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Pesticides by GCMS	EP068	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH olatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)

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

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2107291**

Client	: **WSP Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: Leila Bowe	Contact	: Brenda Hong
Address	: ABN: 80 078 004 798 GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: leila.bowe wsp.com	E-mail	: Brenda.Hong ALSGlobal.com
Telephone	: ----	Telephone	: +61 2 8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: PS123745 - EMKC ST MARYS ESA	Page	: 1 of 2
Order number	: ----	Quote number	: ES2017PARBRINSW0009 (EN/085/17)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 ALS QC Standard
Site	: ----		
Sampler	: Leila Bowe		

Dates

Date Samples Received	: 02-Mar-2021 12:20	Issue Date	: 03-Mar-2021
Client Requested Due Date	: 09-Mar-2021	Scheduled Reporting Date	: **09-Mar-2021**

Delivery Details

Mode of Delivery	: Undefined	Security Seal	: Intact.
No. of coolers/boxes	: ----	Temperature	: 5.6 C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

eneral Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis re uested.**
- **Sample QA01A will be forwarded to Eurofins.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6 C for chemical analysis, and less than or equal to 10 C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non Compliances

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

No sample container / preservation non-compliance exists.

Summary of Sample(s) and Requested Analysis

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

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP080 BTEXN	WATER - W-12 OC/OP Pesticides	WATER - W-18 TRH(C6 - C9)/BTEXN	WATER - W-26 TRH/BTEXN/PAH/8 Metals
ES2107291-001	01-Mar-2021 00:00	GW01		☐		☐
ES2107291-002	01-Mar-2021 00:00	GW02		☐		☐
ES2107291-003	01-Mar-2021 00:00	GW03		☐		☐
ES2107291-004	01-Mar-2021 00:00	QA01		☐		☐
ES2107291-005	01-Mar-2021 00:00	Trip Blank			☐	
ES2107291-006	01-Mar-2021 00:00	Trip Spike 9	☐			
ES2107291-007	01-Mar-2021 00:00	Trip Spike 10	☐			

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	AU.AccountsPayable@wsp.com

Colin Mckay

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

Leila Bowe

- AU Certificate of Analysis - NATA (COA)	Email	leila.bowe@wsp.com
- AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	leila.bowe@wsp.com
- AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	leila.bowe@wsp.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	leila.bowe@wsp.com
- A4 - AU Tax Invoice (INV)	Email	leila.bowe@wsp.com
- Chain of Custody (CoC) (COC)	Email	leila.bowe@wsp.com
- EDI Format - ENMRG (ENMRG)	Email	leila.bowe@wsp.com
- EDI Format - ESDAT (ESDAT)	Email	leila.bowe@wsp.com

ALS HAIN OF USTODY

ALS Laboratory
please tick →

CLIENT: WSP	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☒ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE:			Custody Seal Intact? Yes No N/A
PROJECT: PS123745 - EMKC St Marys ESA	ALS QUOTE NO.: EN-085-17	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER:		OF: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Leila Bowe	CONTACT PH: 0468453715		Other comment:

SAMPLER: Leila Bowe	SAMPLER MOBILE: 0468453715	RELINQUISHED BY: Leila Bowe	RECEIVED BY: [signature]	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): Esdat and PDF	DATE/TIME: 2/03/21	DATE/TIME: 2/3/21 12:14	DATE/TIME:	DATE/TIME:

Email Reports to: leila.bowe@wsp.com, colin.mckay@wsp.com

Email Invoice to (will default to PM if no other addresses are listed): leila.bowe@wsp.com

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

SAMPLE DETAILS MATRIX: SOLID (S) WATER (W) — CONTAINER INFORMATION — ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price). Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	W-26: TRH, BTEXN, PAHs, heavy metals	W-18: TRH (C6-C10), BTEXN	W-12: OC/OP	Additional Information
1	GW01	1/03/2021	W		4	x		x	
2	GW02	1/03/2021	W		4	x		x	
3	GW03	1/03/2021	W		4	x		x	
4	QA01	1/03/2021	W		4	x		x	
X	QA01A	1/03/2021	W		4	x		x	Forward to Eurofins
5	Trip Blank	1/03/2021	W		1		x		
6	Trip Spike	1/03/2021	W		1		x		
				TOTAL	2	5	2	5	

Additional Information: Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.

Environmental Division
Sydney
Work Order Reference
ES2107291

Telephone: + 61 2 8784 8555

Subcontracted / Forward to / Split WO:
Lab / Analysis: Eurofins (QA01A)
Organised By / Date:
Relinquished By / Date:
Connote / Courier:
WO No:
Attach By PO / Internal Sheet:

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: WSP	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE:		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes / No / N/A
PROJECT: PS123745 - EMKC St Marys ESA	ALS QUOTE NO.: EN-085-17	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes / No / N/A
ORDER NUMBER:		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Leila Bowe	CONTACT PH: 0468453715	OF: 1 2 3 4 5 6 7	Other comment: 19.1
SAMPLER: Leila Bowe	SAMPLER MOBILE: 0468453715	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): Esdat and PDF	Leila Bowe	
Email Reports to: leila.bowe@wsp.com, colin.mckay@wsp.com		DATE/TIME: 25/02/21	DATE/TIME: 25/2/21 15:15
Email Invoice to (will default to PM if no other addresses are listed): leila. bowe@wsp.com		RELINQUISHED BY:	RECEIVED BY:
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:		DATE/TIME:	DATE/TIME:

ALS USE	SAMPLE DETAILS - MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).							
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant.	Hold	Additional Information Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	TP03_0.1	24/02/21	S		1				X			
2	TP13_0.5		S		1	X		X				
3	TP13_3.0		S		1						X	
4	TP12_0.1		S		1				X			
5	TP12_0.5		S		1	X		X				
6	TP12_1.0		S		1						X	
7	TP11_0.1		S		1				X			
8	TP11_0.5		S		1	X		X				
9	TP10_0.1		S		1				X			
10	TP10_0.5		S		1						X	
11	TP04_0.1		S		1				X			
12	TP04_0.5		S		1	X		X				
				TOTAL	24	4	0	4	5		3	

Environmental Division Sydney
Work Order Reference
ES2106968

Telephone : +61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulfate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: WSP	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE:		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes / No / N/A
PROJECT: PS123745 - EMKC St Marys ESA	ALS QUOTE NO.: EN-085-17	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes / No / N/A
ORDER NUMBER:		COC: 1 (2) 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Leila Bowe	CONTACT PH: 0468453715	OF: 1 2 3 (4) 5 6 7	Other comment: 19-1
SAMPLER: Leila Bowe	SAMPLER MOBILE: 0468453715	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): Esdat and PDF	Leila Bowe	
Email Reports to: leila.bowe@wsp.com, colin.mckay@wsp.com		DATE/TIME: 25/02/21	DATE/TIME: 25.2.21 15:45
Email Invoice to (will default to PM if no other addresses are listed): leila. bowe@wsp.com		RELINQUISHED BY:	RECEIVED BY:
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:		DATE/TIME:	DATE/TIME:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant.	4 day.				Additional Information Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	TP04_Was 2.5	24/02/21	S		1						X				
2	TP05_0.5				2				X						
	TP05_1.0				1	X		X							
	TP03_0.5				2	X		X	X						
	TP14_0.1				1				X						
5	TP14_0.5				1	X		X							
6	TP02_0.1				1				X						
	TP02_0.5				1						X				
	TP02_1.0				1	X		X							
	TP01_0.1				1				X						
12	TP01_0.5				1	X		X							
14	TP01_1.5				1						X				
					14	5	0	5	5		3				

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulfate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: WSP	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT (List due date):
OFFICE:		☐ Non Standard or urgent TAT (List due date):
PROJECT: P8123745 - EMKC St Marys ESA	ALS QUOTE NO.: EN-055-17	COC SEQUENCE NUMBER (Circle) COC: 1 2 (3) 4 5 6 7 OF: 1 2 3 (4) 5 6 7
ORDER NUMBER:		
PROJECT MANAGER: Leila Bowe	CONTACT PH: 0468453715	
SAMPLER: Leila Bowe	SAMPLER MOBILE: 0468453715	
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): Esdat and PDF	
Email Reports to: leila.bowe@wsp.com, colin.mckay@wsp.com		
Email Invoice to (will default to PM if no other addresses are listed): leila. bowe@wsp.com		

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comment:	19-1		

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Leila Bowe			
DATE/TIME: 25/02/21	DATE/TIME:	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant.	Hold				Additional Information Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	TP06_0.1	24/02/21	S		1				X						
	TP06_0.5				1	X		X							
	TP06_1.0				1						X				
	TP15_0.1				1				X						
	TP15_0.5				1						X				
	TP15_1.0				1	X		X							
	TP09_0.5				2	X		X		X					
	TP09_0.5 FRAG				1				X	[illegible]					
	TP09_1.0				1						X				
	TP08_0.2				2				X						
	TP08_0.5				1										
	TP08_1.0				1	X		[illegible]							
				TOTAL	12	44	40	43	4	1	3				

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

HAIN OF USTODY

ALS Laboratory: please tick →

CLIENT: WSP	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE:		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes / No / N/A
PROJECT: P8123745 - EMKC St Marys ESA	ALS QUOTE NO.: EN-085-17	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes / No / N/A
ORDER NUMBER:		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Leila Bowe	CONTACT PH: 0468453715	OF: 1 2 3 4 5 6 7	Other comment: 19.4
SAMPLER: Leila Bowe	SAMPLER MOBILE: 0468453715	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): Esdat and PDF	Leila Bowe	DATE/TIME: 25/12/21 1545
Email Reports to: leila.bowe@wsp.com, colin.mckay@wsp.com		DATE/TIME: 24/02/21	RELINQUISHED BY:
Email Invoice to (will default to PM if no other addresses are listed): leila. bowe@wsp.com			DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant.					Additional Information Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	TP07_0.5	24/02/21	S		2	X		X	X						
	TP07_1.0				2										
2.9	QA01				1	X		X							
	QA01A				1	X		X							Forward to Eurofins
4.6	Trip blank				1		X								
	Trip Spike				1		X								
	BH03_0.7	25/02/21			1				X						
	BH02_0.5				1	X		X							
	BH03_0.5				1	X		X							
	BH03_1.0				1				X						
	BH04/QAW01_0.5	24/02/21			1				X						
	BH04_0.5				1	X		X							
					TOTAL: 2	2	2	2							

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

BH05 - 0.5 24/02/21 2 X X X

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: WSP	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE:		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes / No / N/A
PROJECT: PS123745 - EMKC St Marys ESA	ALS QUOTE NO.: EN-085-17	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes / No / N/A
ORDER NUMBER:		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Leila Bowe	CONTACT PH: 0468453715	OF: 1 2 3 4 5 6 7	Other comment: 19.1
SAMPLER: Leila Bowe	SAMPLER MOBILE: 0468453715	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): Esdat and PDF	Leila Bowe	
Email Reports to: leila.bowe@wsp.com, colin.mckay@wsp.com		DATE/TIME: 25/02/21	DATE/TIME: 25/2/21 15:15
Email Invoice to (will default to PM if no other addresses are listed): leila. bowe@wsp.com		RELINQUISHED BY:	RECEIVED BY:
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:		DATE/TIME:	DATE/TIME:

ALS USE	SAMPLE DETAILS - MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).							
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant.	Hold	Additional Information Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	TP03_0.1	24/02/21	S		1				X			
2	TP13_0.5		S		1	X		X				
3	TP13_3.0		S		1						X	
4	TP12_0.1		S		1				X			
5	TP12_0.5		S		1	X		X				
6	TP12_1.0		S		1						X	
7	TP11_0.1		S		1				X			
8	TP11_0.5		S		1	X		X				
9	TP10_0.1		S		1				X			
10	TP10_0.5		S		1						X	
11	TP04_0.1		S		1				X			
12	TP04_0.5		S		1	X		X				
				TOTAL	24	4	0	4	5		3	

Environmental Division Sydney
Work Order Reference
ES2106968

Telephone : +61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulfate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: WSP	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE:		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes / No / N/A
PROJECT: PS123745 - EMKC St Marys ESA	ALS QUOTE NO.: EN-085-17	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes / No / N/A
ORDER NUMBER:		COC: 1 (2) 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Leila Bowe	CONTACT PH: 0468453715	OF: 1 2 3 (4) 5 6 7	Other comment: 19-1
SAMPLER: Leila Bowe	SAMPLER MOBILE: 0468453715	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): Esdat and PDF	Leila Bowe	
Email Reports to: leila.bowe@wsp.com, colin.mckay@wsp.com		DATE/TIME: 25/02/21	DATE/TIME: 25.2.21 15:45
Email Invoice to (will default to PM if no other addresses are listed): leila. bowe@wsp.com		RELINQUISHED BY:	RECEIVED BY:
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:		DATE/TIME:	DATE/TIME:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant.	4 day.				Additional Information Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	TP04_Was 2.5	24/02/21	S		1						X				
2	TP05_0.5				2				X						
	TP05_1.0				1	X		X							
	TP03_0.5				2	X		X	X						
	TP14_0.1				1				X						
5	TP14_0.5				1	X		X							
6	TP02_0.1				1				X						
	TP02_0.5				1						X				
	TP02_1.0				1	X		X							
	TP01_0.1				1				X						
12	TP01_0.5				1	X		X							
14	TP01_1.5				1						X				
					14	5	0	5	5		3				

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulfate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: WSP	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT (List due date):
OFFICE:		☐ Non Standard or urgent TAT (List due date):
PROJECT: P8123745 - EMKC St Marys ESA	ALS QUOTE NO.: EN-055-17	COC SEQUENCE NUMBER (Circle) COC: 1 2 (3) 4 5 6 7 OF: 1 2 3 (4) 5 6 7
ORDER NUMBER:		
PROJECT MANAGER: Leila Bowe	CONTACT PH: 0468453715	
SAMPLER: Leila Bowe	SAMPLER MOBILE: 0468453715	
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): Esdat and PDF	
Email Reports to: leila.bowe@wsp.com, colin.mckay@wsp.com		
Email Invoice to (will default to PM if no other addresses are listed): leila. bowe@wsp.com		

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comment:	19-1		

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Leila Bowe			
DATE/TIME: 25/02/21	DATE/TIME:	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant.	Hold				Additional Information Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	TP06_0.1	24/02/21	S		1				X						
	TP06_0.5				1	X		X							
	TP06_1.0				1						X				
	TP15_0.1				1				X						
	TP15_0.5				1						X				
	TP15_1.0				1	X		X							
	TP09_0.5				2	X		X		X					
	TP09_0.5 FRAG				1				X	[illegible]					
	TP09_1.0				1						X				
	TP08_0.2				2				X						
	TP08_0.5				1										
	TP08_1.0				1	X		[illegible]							
				TOTAL	12	44	40	43	4	1	3				

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

HAIN OF USTODY

ALS Laboratory: please tick →

CLIENT: WSP	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE:		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes / No / N/A
PROJECT: P8123745 - EMKC St Marys ESA	ALS QUOTE NO.: EN-085-17	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes / No / N/A
ORDER NUMBER:		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Leila Bowe	CONTACT PH: 0468453715	OF: 1 2 3 4 5 6 7	Other comment: 19.4
SAMPLER: Leila Bowe	SAMPLER MOBILE: 0468453715	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): Esdat and PDF	Leila Bowe	DATE/TIME: 25/12/21 1545
Email Reports to: leila.bowe@wsp.com, colin.mckay@wsp.com		DATE/TIME: 24/02/21	RELINQUISHED BY:
Email Invoice to (will default to PM if no other addresses are listed): leila. bowe@wsp.com			DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26: TRH, BTEXN, PAHs, heavy metals	S-18: TRH (C6-C10), BTEXN	S-12: OC/OP	Asbestos (presence/absence)	Asbestos NEPM Quant.					Additional Information Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	TP07_0.5	24/02/21	S		2	X		X	X						
	TP07_1.0				2										
2.9	QA01				1	X		X							
	QA01A				1	X		X							Forward to Eurofins
4.6	Trip blank				1		X								
	Trip Spike				1		X								
	BH03_0.7	25/02/21			1				X						
	BH02_0.5				1	X		X							
	BH03_0.5				1	X		X							
	BH03_1.0				1				X						
	BH04/QAW01_0.5	24/02/21			1				X						
	BH04_0.5				1	X		X							
					TOTAL: 2	2	2	2							

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

BH05 - 0.5 24/02/21 2 X X X

eurofins | Environment Testing

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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
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Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Newcastle
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Mayfield East NSW 2304
PO Box 60 Wickham 2293
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New Zealand

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Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Sample Receipt Advice

Company name:	WSP Australia P/L NSW
Contact name:	Leila Bowe
Project name:	PS123745-EMKC ST MARYS ESA
Project ID:	Not provided
Turnaround time:	5 Day
Date/Time received	Mar 1, 2021 4:10 PM
Eurofins reference	777253

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	Sample Temperature of a random sample selected from the batch as recorded by Eurofins Sample Receipt : 11.9 degrees Celsius.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Elvis Dsouza on phone : or by email: ElvisDsouza@eurofins.com

Results will be delivered electronically via email to Leila Bowe - leila.bowe@wsp.com.

Note: A copy of these results will also be delivered to the general WSP Australia P/L NSW email address.

Global Leader - Results you can trust

eurofins | Environment Testing

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Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

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1/21 Smallwood Place
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Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: WSP Australia P/L NSW
Address: Level 27, Ernst & Young Centre
Sydney
NSW 2001

Project Name: PS123745-EMKC ST MARYS ESA

Order No.:
Report #: 777253
Phone: 02 9272 5586
Fax: 02 9272 5101

Received: Mar 1, 2021 4:10 PM
Due: Mar 8, 2021
Priority: 5 Day
Contact Name: Leila Bowe

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Suite B14: OCP/OPP	Moisture Set	Eurofins Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
Mayfield Laboratory								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	QA01A	Feb 24, 2021		Soil	S21-Ma02292	X	X	X
Test Counts						1	1	1

WSP Australia P/L NSW
Level 27, Ernst & Young Centre
Sydney
NSW 2001

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Leila Bowe**

Report **777253-S**
Project name PS123745-EMKC ST MARYS ESA
Received Date Mar 01, 2021

Client Sample ID			**QA01A**
Sample Matrix			**Soil**
Eurofins Sample No.			**S21-Ma02292**
Date Sampled			**Feb 24, 2021**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	70
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5

Client Sample ID			QA01A
Sample Matrix			Soil
Eurofins Sample No.			S21-Ma02292
Date Sampled			Feb 24, 2021
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	105
p-Terphenyl-d14 (surr.)	1	%	99
Organochlorine Pesticides			
Chlordanes - Total	0.1	mg/kg	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05
a-BHC	0.05	mg/kg	< 0.05
Aldrin	0.05	mg/kg	< 0.05
b-BHC	0.05	mg/kg	< 0.05
d-BHC	0.05	mg/kg	< 0.05
Dieldrin	0.05	mg/kg	0.78
Endosulfan I	0.05	mg/kg	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05
Endrin	0.05	mg/kg	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05
Heptachlor	0.05	mg/kg	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2
Toxaphene	0.1	mg/kg	< 0.1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	0.99
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	0.99
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2
Dibutylchlorendate (surr.)	1	%	93
Tetrachloro-m-xylene (surr.)	1	%	104
Organophosphorus Pesticides			
Azinphos-methyl	0.2	mg/kg	< 0.2
Bolstar	0.2	mg/kg	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2
Coumaphos	2	mg/kg	< 2
Demeton-S	0.2	mg/kg	< 0.2
Demeton-O	0.2	mg/kg	< 0.2
Diazinon	0.2	mg/kg	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2
Dimethoate	0.2	mg/kg	< 0.2

Client Sample ID			QA01A
Sample Matrix			Soil
Eurofins Sample No.			S21-Ma02292
Date Sampled			Feb 24, 2021
Test/Reference	LOR	Unit	
Organophosphorus Pesticides			
Disulfoton	0.2	mg/kg	< 0.2
EPN	0.2	mg/kg	< 0.2
Ethion	0.2	mg/kg	< 0.2
Ethoprop	0.2	mg/kg	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2
Fenthion	0.2	mg/kg	< 0.2
Malathion	0.2	mg/kg	< 0.2
Merphos	0.2	mg/kg	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2
Mevinphos	0.2	mg/kg	< 0.2
Monocrotophos	2	mg/kg	< 2
Naled	0.2	mg/kg	< 0.5
Omethoate	2	mg/kg	< 2
Phorate	0.2	mg/kg	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2
Ronnel	0.2	mg/kg	< 0.2
Terbufos	0.2	mg/kg	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2
Tokuthion	0.2	mg/kg	< 0.2
Trichloronate	0.2	mg/kg	< 0.2
Triphenylphosphate (surr.)	1	%	101
Heavy Metals			
Arsenic	2	mg/kg	6.3
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	14
Copper	5	mg/kg	14
Lead	5	mg/kg	33
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	5.3
Zinc	5	mg/kg	56
% Moisture	1	%	9.0

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Mar 05, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Mar 05, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Mar 05, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Mar 05, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Mar 05, 2021	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Mar 05, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Organochlorine Pesticides	Sydney	Mar 05, 2021	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	Mar 05, 2021	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
% Moisture	Sydney	Mar 02, 2021	14 Days
- Method: LTM-GEN-7080 Moisture			

eurofins | Environment Testing

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NATA # 1261 Site # 18217

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IANZ # 1290

Company Name: WSP Australia P/L NSW
Address: Level 27, Ernst & Young Centre
Sydney
NSW 2001

Project Name: PS123745-EMKC ST MARYS ESA

Order No.:
Report #: 777253
Phone: 02 9272 5586
Fax: 02 9272 5101

Received: Mar 1, 2021 4:10 PM
Due: Mar 8, 2021
Priority: 5 Day
Contact Name: Leila Bowe

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Suite B14: OCP/OPP	Moisture Set	Eurofins Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
Mayfield Laboratory								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	QA01A	Feb 24, 2021		Soil	S21-Ma02292	X	X	X
Test Counts						1	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	110			70-130	Pass	
TRH C10-C14	%	70			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	117			70-130	Pass	
Toluene	%	120			70-130	Pass	
Ethylbenzene	%	116			70-130	Pass	
m&p-Xylenes	%	120			70-130	Pass	
o-Xylene	%	120			70-130	Pass	
Xylenes - Total*	%	120			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	98			70-130	Pass	
TRH C6-C10	%	106			70-130	Pass	
TRH >C10-C16	%	70			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	83			70-130	Pass	
Acenaphthylene	%	93			70-130	Pass	
Anthracene	%	91			70-130	Pass	
Benz(a)anthracene	%	90			70-130	Pass	
Benzo(a)pyrene	%	97			70-130	Pass	
Benzo(b&j)fluoranthene	%	88			70-130	Pass	
Benzo(g.h.i)perylene	%	97			70-130	Pass	
Benzo(k)fluoranthene	%	97			70-130	Pass	
Chrysene	%	92			70-130	Pass	
Dibenz(a.h)anthracene	%	86			70-130	Pass	
Fluoranthene	%	87			70-130	Pass	
Fluorene	%	84			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	88			70-130	Pass	
Naphthalene	%	87			70-130	Pass	
Phenanthrene	%	94			70-130	Pass	
Pyrene	%	88			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	116			70-130	Pass	
4.4'-DDD	%	88			70-130	Pass	
4.4'-DDE	%	101			70-130	Pass	
4.4'-DDT	%	113			70-130	Pass	
a-BHC	%	107			70-130	Pass	
Aldrin	%	107			70-130	Pass	
b-BHC	%	97			70-130	Pass	
d-BHC	%	96			70-130	Pass	
Dieldrin	%	105			70-130	Pass	
Endosulfan I	%	93			70-130	Pass	
Endosulfan II	%	94			70-130	Pass	
Endosulfan sulphate	%	101			70-130	Pass	
Endrin	%	120			70-130	Pass	
Endrin aldehyde	%	100			70-130	Pass	
Endrin ketone	%	91			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
g-BHC (Lindane)	%	104			70-130	Pass	
Heptachlor	%	122			70-130	Pass	
Heptachlor epoxide	%	122			70-130	Pass	
Hexachlorobenzene	%	108			70-130	Pass	
Methoxychlor	%	112			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	106			70-130	Pass	
Dimethoate	%	87			70-130	Pass	
Ethion	%	100			70-130	Pass	
Mevinphos	%	111			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	98			80-120	Pass	
Cadmium	%	98			80-120	Pass	
Chromium	%	97			80-120	Pass	
Copper	%	97			80-120	Pass	
Lead	%	96			80-120	Pass	
Mercury	%	99			80-120	Pass	
Nickel	%	97			80-120	Pass	
Zinc	%	96			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S21-Ma10324	NCP	%	86			70-130	Pass	
TRH C10-C14	S21-Ma02656	NCP	%	110			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S21-Ma10324	NCP	%	87			70-130	Pass	
Toluene	S21-Ma10324	NCP	%	94			70-130	Pass	
Ethylbenzene	S21-Ma10324	NCP	%	93			70-130	Pass	
m&p-Xylenes	S21-Ma10324	NCP	%	96			70-130	Pass	
o-Xylene	S21-Ma10324	NCP	%	100			70-130	Pass	
Xylenes - Total*	S21-Ma10324	NCP	%	97			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S21-Ma10324	NCP	%	78			70-130	Pass	
TRH C6-C10	S21-Ma10324	NCP	%	83			70-130	Pass	
TRH >C10-C16	S21-Ma02656	NCP	%	113			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S21-Ma00766	NCP	%	75			70-130	Pass	
Acenaphthylene	S21-Ma00766	NCP	%	86			70-130	Pass	
Anthracene	S21-Ma00766	NCP	%	87			70-130	Pass	
Benz(a)anthracene	S21-Ma00766	NCP	%	83			70-130	Pass	
Benzo(a)pyrene	S21-Ma00766	NCP	%	85			70-130	Pass	
Benzo(b&j)fluoranthene	S21-Ma00766	NCP	%	80			70-130	Pass	
Benzo(g.h.i)perylene	S21-Ma00766	NCP	%	68			70-130	Fail	Q08
Benzo(k)fluoranthene	S21-Ma00766	NCP	%	87			70-130	Pass	
Chrysene	S21-Ma00766	NCP	%	85			70-130	Pass	
Dibenz(a.h)anthracene	S21-Ma00766	NCP	%	72			70-130	Pass	
Fluoranthene	S21-Ma00766	NCP	%	89			70-130	Pass	
Fluorene	S21-Ma00766	NCP	%	76			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S21-Ma00766	NCP	%	71			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Naphthalene	S21-Ma00766	NCP	%	81			70-130	Pass	
Phenanthrene	S21-Ma00766	NCP	%	86			70-130	Pass	
Pyrene	S21-Ma00766	NCP	%	93			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S21-Ma00766	NCP	%	95			70-130	Pass	
4.4'-DDD	S21-Ma00766	NCP	%	99			70-130	Pass	
4.4'-DDE	S21-Ma00766	NCP	%	93			70-130	Pass	
4.4'-DDT	S21-Ma08990	NCP	%	109			70-130	Pass	
a-BHC	S21-Ma00766	NCP	%	93			70-130	Pass	
Aldrin	S21-Ma00766	NCP	%	93			70-130	Pass	
b-BHC	S21-Ma00766	NCP	%	86			70-130	Pass	
d-BHC	S21-Ma00766	NCP	%	96			70-130	Pass	
Dieldrin	S21-Ma00766	NCP	%	85			70-130	Pass	
Endosulfan I	S21-Ma00766	NCP	%	93			70-130	Pass	
Endosulfan II	S21-Ma00766	NCP	%	75			70-130	Pass	
Endosulfan sulphate	S21-Ma00766	NCP	%	74			70-130	Pass	
Endrin	S21-Ma00766	NCP	%	87			70-130	Pass	
Endrin aldehyde	S21-Ma08990	NCP	%	83			70-130	Pass	
Endrin ketone	S21-Ma00766	NCP	%	79			70-130	Pass	
g-BHC (Lindane)	S21-Ma00766	NCP	%	88			70-130	Pass	
Heptachlor	S21-Ma00766	NCP	%	89			70-130	Pass	
Heptachlor epoxide	S21-Ma00766	NCP	%	92			70-130	Pass	
Hexachlorobenzene	S21-Ma00766	NCP	%	89			70-130	Pass	
Methoxychlor	S21-Ma00766	NCP	%	73			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	S21-Ma00766	NCP	%	107			70-130	Pass	
Dimethoate	S21-Ma00766	NCP	%	85			70-130	Pass	
Ethion	S21-Ma00766	NCP	%	96			70-130	Pass	
Fenitrothion	S21-Ma00766	NCP	%	108			70-130	Pass	
Methyl parathion	S21-Ma00766	NCP	%	112			70-130	Pass	
Mevinphos	S21-Ma00766	NCP	%	112			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S21-Ma02585	NCP	%	113			75-125	Pass	
Cadmium	S21-Ma02585	NCP	%	102			75-125	Pass	
Chromium	S21-Ma02585	NCP	%	107			75-125	Pass	
Copper	S21-Ma02585	NCP	%	108			75-125	Pass	
Lead	S21-Ma02585	NCP	%	111			75-125	Pass	
Mercury	S21-Ma02585	NCP	%	105			75-125	Pass	
Nickel	S21-Ma02585	NCP	%	105			75-125	Pass	
Zinc	S21-Ma02585	NCP	%	100			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S21-Ma02587	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S21-Ma01830	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S21-Ma01830	NCP	mg/kg	98	88	11	30%	Pass	
TRH C29-C36	S21-Ma01830	NCP	mg/kg	110	110	1.0	30%	Pass	

Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S21-Ma02587	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S21-Ma02587	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S21-Ma02587	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S21-Ma02587	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S21-Ma02587	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S21-Ma02587	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S21-Ma02587	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S21-Ma02587	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S21-Ma01830	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S21-Ma01830	NCP	mg/kg	170	160	7.0	30%	Pass	
TRH >C34-C40	S21-Ma01830	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S21-Ma04317	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S21-Ma04317	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S21-Ma04317	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S21-Ma04317	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S21-Ma04317	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S21-Ma04317	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S21-Ma04317	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S21-Ma04317	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S21-Ma04317	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S21-Ma04317	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S21-Ma04317	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S21-Ma04317	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S21-Ma04317	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S21-Ma04317	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S21-Ma04317	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S21-Ma04317	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S21-Ma04317	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S21-Ma04317	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S21-Ma04317	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S21-Ma04317	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S21-Ma04317	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S21-Ma04317	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S21-Ma04317	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S21-Ma04317	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S21-Ma04317	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S21-Ma04317	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S21-Ma04317	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S21-Ma04317	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S21-Ma04317	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S21-Ma04317	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S21-Ma04317	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S21-Ma04317	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S21-Ma04317	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S21-Ma04317	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S21-Ma04317	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S21-Ma04317	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S21-Fe53959	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S21-Fe53959	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S21-Fe53959	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Omethoate	S21-Fe53959	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S21-Fe53959	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S21-Ma04714	NCP	mg/kg	6.4	6.9	7.0	30%	Pass	
Cadmium	S21-Ma04714	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S21-Ma04714	NCP	mg/kg	20	24	18	30%	Pass	
Copper	S21-Ma04714	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	S21-Ma04714	NCP	mg/kg	18	15	21	30%	Pass	
Mercury	S21-Ma04714	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S21-Ma04714	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S21-Ma04714	NCP	mg/kg	15	< 5	140	30%	Fail	Q15
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S21-Ma01938	NCP	%	13	14	6.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Elvis Dsouza	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
John Nguyen	Senior Analyst-Metal (NSW)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

177969

HAIN OF USTODY

ALS Laboratory: please tick →

JOHNS AVE 14-15 Dennis Court Bohle QLD 4818
Ph: 07 4964 6... Fax: ... E: townsville.environmental@alsglobal.com

CLIENT: WSP	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle) Custody seal intact? Yes / No / NA; Free ice / frozen particles present upon receipt? Yes / No / NA; Random Sample Temperature on Receipt: Other comments:
OFFICE:		☐ Non Standard or urgent TAT (List due date):	
PROJECT: P0123745 - EMKC St Marys ESA	ALS QUOTE NO.: EN-065-17	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	
ORDER NUMBER:			
PROJECT MANAGER: Leila Bowe	CONTACT PH: 0468463715		
SAMPLER: Leila Bowe	SAMPLER MOBILE: 0468463715	RELINQUISHED BY: Leila Bowe	RECEIVED BY: HAm
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): Esdat and PDF	DATE/TIME: 2/03/21	DATE/TIME: 4/3/21 12:14
Email Reports to: leila.bowe@wsp.com, colin.mckay@wsp.com		RELINQUISHED BY:	RECEIVED BY: Mylene Ford
Email Invoice to (will default to PM if no other addresses are listed): leila. bowe@wsp.com		DATE/TIME:	DATE/TIME: 5/3/2021 5:55PM

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)	CONTAINER INFORMATION		ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).				
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	W-26: TRH, BTEXN, PAHs, heavy metals	W-18: TRH (C6-C10), BTEXN	W-12: OC/OP	Additional Information Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	GW01	1/03/2021	W		4	x		x	
2	GW02	1/03/2021	W		4	x		x	
3	GW03	1/03/2021	W		4	x		x	
4	QA01	1/03/2021	W		4	x		x	
X	QA01A	1/03/2021	W		4	x		x	
1	Trip Blank	1/03/2021	W		1		x		
1	Trip Spike	1/03/2021	W		1		x		
				TOTALS	2	5	2	5	

Environmental Division Sydney
Work Order Reference
ES2107291

Telephone : +61-2-8784 8555

Forward to Eurofins

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS= Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag;

177969

HAIN OF USTODY

ALS Laboratory: please tick →

JOHNS AVE 14-15 Dennis Court Bohle QLD 4818
Ph: 07 4964 6... Fax: ... E: townsville.environmental@alsglobal.com

CLIENT: WSP	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle) Custody seal intact? Yes / No / NA; Free ice / frozen particles present upon receipt? Yes / No / NA; Random Sample Temperature on Receipt: Other comments:
OFFICE:		☐ Non Standard or urgent TAT (List due date):	
PROJECT: P0123745 - EMKC St Marys ESA	ALS QUOTE NO.: EN-065-17	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	
ORDER NUMBER:			
PROJECT MANAGER: Leila Bowe	CONTACT PH: 0468463715		
SAMPLER: Leila Bowe	SAMPLER MOBILE: 0468463715	RELINQUISHED BY: Leila Bowe	RECEIVED BY: HAm
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default): Esdat and PDF	DATE/TIME: 2/03/21	DATE/TIME: 4/3/21 12:14
Email Reports to: leila.bowe@wsp.com, colin.mckay@wsp.com		RELINQUISHED BY:	RECEIVED BY: Mylene Ford
Email Invoice to (will default to PM if no other addresses are listed): leila. bowe@wsp.com		DATE/TIME:	DATE/TIME: 5/3/2021 5:55PM

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)	CONTAINER INFORMATION		ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).				
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	W-26: TRH, BTEXN, PAHs, heavy metals	W-18: TRH (C6-C10), BTEXN	W-12: OC/OP	Additional Information Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	GW01	1/03/2021	W		4	x		x	
2	GW02	1/03/2021	W		4	x		x	
3	GW03	1/03/2021	W		4	x		x	
4	QA01	1/03/2021	W		4	x		x	
X	QA01A	1/03/2021	W		4	x		x	
1	Trip Blank	1/03/2021	W		1		x		
1	Trip Spike	1/03/2021	W		1		x		
				TOTALS	2	5	2	5	

Environmental Division Sydney
Work Order Reference
ES2107291

Telephone : +61-2-8784 8555

Forward to Eurofins

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS= Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag;

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Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Sample Receipt Advice

Company name:	WSP Australia P/L NSW
Contact name:	Leila Bowe
Project name:	EMKC ST MARYS ESA
Project ID:	PS123745
Turnaround time:	5 Day
Date/Time received	Mar 3, 2021 5:55 PM
Eurofins reference	777969

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	Sample Temperature of a random sample selected from the batch as recorded by Eurofins Sample Receipt : 16.2 degrees Celsius.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Samples received by the laboratory after 5.30pm are deemed to have been received the following working day.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Elvis Dsouza on phone : or by email: ElvisDsouza@eurofins.com

Results will be delivered electronically via email to Leila Bowe - leila.bowe@wsp.com.

Note: A copy of these results will also be delivered to the general WSP Australia P/L NSW email address.

Global Leader - Results you can trust

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IANZ # 1290

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Company name:	WSP Australia P/L NSW
Contact name:	Leila Bowe
Project name:	EMKC ST MARYS ESA
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Turnaround time:	5 Day
Date/Time received	Mar 3, 2021 5:55 PM
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IANZ # 1290

Company Name: WSP Australia P/L NSW
Address: Level 27, Ernst & Young Centre
Sydney
NSW 2001

Project Name: EMKC ST MARYS ESA
Project ID: PS123745

Order No.:
Report #: 777969
Phone: 02 9272 5586
Fax: 02 9272 5101

Received: Mar 3, 2021 5:55 PM
Due: Mar 10, 2021
Priority: 5 Day
Contact Name: Leila Bowe

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Suite B14: OCP/OPP	Eurofins Suite B7 (filtered metals)
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
Mayfield Laboratory							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	QA01A	Mar 01, 2021		Water	S21-Ma07973	X	X
Test Counts						1	1

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

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Company Name: WSP Australia P/L NSW
Address: Level 27, Ernst & Young Centre
Sydney
NSW 2001

Project Name: EMKC ST MARYS ESA
Project ID: PS123745

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Received: Mar 3, 2021 5:55 PM
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Priority: 5 Day
Contact Name: Leila Bowe

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Sample Detail						Suite B14: OCP/OPP	Eurofins Suite B7 (filtered metals)
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
Mayfield Laboratory							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	QA01A	Mar 01, 2021		Water	S21-Ma07973	X	X
Test Counts						1	1

APPENDIX F

QA/QC

Table F1. Field Blank Results

			TRH		BTEX												PAH	
			C6 - C10	C6 - C10	Benzene		Toluene		Ethylbenzene		Xylene (m & p)		Xylene (o)		Xylene (Sum)	Xylene (Sum)	Naphthalene	Naphthalene
			mg/kg	µg/L	mg/kg	µg/L	mg/kg	µg/L	mg/kg	µg/L	mg/kg	µg/L	mg/kg	µg/L	mg/kg	µg/L	mg/kg	µg/L
EQL			10	20	0.2	1	0.5	2	0.5	2	0.5	2	0.5	2	0.5	2	1	5
Field ID	**Media**	**Date**																
TRIP BLABK	**Soil**	**24/02/2021**	<10	-	<0.2	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<1	-
TRIP SPIKE	**Water**	**24/02/2021**	-		-	<0.2	-	15.7	-	2.7	-	13.8	-	5.8	-	19.6	-	<1
Trip Blank	**Water**	**1/03/2021**	-	<20	-	<1	-	<2	-	<2	-	<2	-	<2	-	<2	-	<5

				TRH					BTEX						PAH									Metals							
				C6 - C10	C10 - C16	C16 - C34	C34 - C40	C10 - C40 (Sum)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene (Sum)	Anthracene	Benzo(a) pyrene	Benzo(b&j)fluoranthene	Benzo(k)fluoranthene	Fluoranthene	Naphthalene	Phenanthrene	PAHs (Sum)	Benzo(a)pyrene TEQ calc (Zero)	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				10	50	100	100	50	0.1	0.1	0.1	0.2	0.1	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2	0.4	2	5	5	0.1	2	5
Lab Report Numb	**Field ID**	**Date**	**Matrix Type**																												
ES2106968	TP09_0.5		soil	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	7	<1	11	12	36	<0.1	5	50
	QA01		soil	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6	<1	9	9	32	<0.1	4	61
RPD				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	20	29	12	0	22	20
ES2106968	TP09_0.5		soil	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	7	<1	11	12	36	<0.1	5	50
777253	QA01A	24/02/2021	soil	<20	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6.3	<0.4	14	14	33	<0.1	5.3	56
RPD				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	24	15	9	0	6	11

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 80% (1 - 4 x EQL); 50% (4 - 10 x EQL); 30% (> 10 x EQL))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

				OCP																													
				4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan	Endrin ketone	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene	Azinophos methyl	Bromophos-ethyl
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.05	0.05	0.05	0.05	0.05	50	0.05	0.05	0.05	0.05	0.05	0.05	0.05	50	50	0.05	0.05	0.05	0.05	50	0.05	0.05	0.05	0.05	0.2	0.1	0.05	0.05
Lab Report Numb	**Field ID**	**Date**	**Matrix Type**																														
ES2106968	TP09_0.5		soil	<0.05	<0.05	<0.05	0.77	<0.05	90	<0.05	0.09	<0.05	<0.05	<0.2	<0.05	0.77	<50	<50	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	-	<0.05	<0.05
	QA01		soil	<0.05	<0.05	<0.05	0.82	<0.05	70	<0.05	0.07	<0.05	<0.05	<0.2	<0.05	0.82	<50	<50	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	-	<0.05	<0.05
RPD				0	0	0	6	0	25	0	25	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0
ES2106968	TP09_0.5		soil	<0.05	<0.05	<0.05	0.77	<0.05	90	<0.05	0.09	<0.05	<0.05	<0.2	<0.05	0.77	<50	<50	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	-	<0.05	<0.05
777253	QA01A	24/02/2021	soil	<0.05	<0.05	<0.05	0.99	<0.05	<100	-	-	<0.05	<0.05	<0.05	<0.05	0.78	-	<50	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1	<0.2	-
RPD				0	0	0	25	0	0	-	-	0	0	0	0	1	-	0	0	0	0	0	0	0	0	0	0	0	-	0	-

**RPDs have only been considered where a concentration is greater than
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptab
***Interlab Duplicates are matched on a per compound basis as methoc

				OPP																			
				Carbophenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Disulfoton	Ethion	Fenamiphos	Fenitrothion	Fenthion	Malathion	Methyl parathion	Monocrotophos	Parathion	Phorate	Pirimphos-ethyl	Prothiofos	Ronnel
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.2	0.05	0.05	0.2	0.05	0.05	0.2	0.2	0.2	0.2	0.05	0.05	0.2
Lab Report Numb	**Field ID**	**Date**	**Matrix Type**																					
ES2106968	**TP09_0.5**		**soil**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	-	<0.05	<0.05	-
	QA01		**soil**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	-	<0.05	<0.05	-
RPD				0	0	0	0	0	0	0	0	-	0	0	-	0	0	0	0	0	-	0	0	-
ES2106968	**TP09_0.5**		**soil**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	-	<0.05	<0.05	-
777253	**QA01A**	**24/02/2021**	**soil**	-	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	-	-	<0.2
RPD				-	0	0	0	-	0	0	0	-	0	-	-	0	0	0	0	0	-	-	-	-

***RPDs have only been considered where a concentration is greater than**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptab**
*****Interlab Duplicates are matched on a per compound basis as methoc**

				TRH					BTEX						PAH									Metals						
				C6 - C10	C10 - C16	C16 - C34	C34 - C40	C10 - C40 (Sum)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene (Sum)	Anthracene	Benzo(a) pyrene	Benzo(b&j)fluoranthene	Benzo(k)fluoranthene	Fluoranthene	Naphthalene	Phenanthrene	PAHs (Sum)	Benzo(a)pyrene TEQ calc (Zero)	Arsenic (filtered)	Cadmium (filtered)	Chromium (filtered)	Copper (filtered)	Lead (filtered)	Mercury (filtered)	Nickel (filtered)
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				20	50	100	100	100	1	1	1	2	1	2	1	0.5	1	1	1	1	1	0.5	0.5	1	0.1	1	1	1	0.1	1
Lab Report Number	**Field ID**	**Date**	**Matrix Type**																											
ES2107291	**GW03**	**1/03/2021**	**water**	<20	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5	<1	0.2	<1	29	<1	<0.1	183
	QA01	**1/03/2021**	**water**	<20	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5	<1	0.2	<1	29	<1	<0.1	183
RPD				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
ES2107291	**GW03**	**1/03/2021**	**water**	<20	<100	<100	<100	<100	<1	<2	<2	<2	<2	<2	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5	<1	0.2	<1	29	<1	<0.1	183
777969	**QA01A**	**1/03/2021**	**water**	<20	<50	300	<100	300	<1	<1	<1	<2	<1	<3	<1	<1	<1	<1	<1	<1	<1	<1	-	2	0.2	<1	27	1	<0.1	170
RPD				0	0	**100**	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	67	0	0	7	0	0	7

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Adopted RPDs for each EQL multiplier range are: 80% (1 - 4 x EQL); 50% (4 - 10 x EQL); 30% (> 10 x EQL))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

Lab Report Number	Field ID	Date	Matrix Type		OCP																									
				Zinc (filtered)	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endrin ketone	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene	Azinophos methyl
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				5	0.1	0.1	0.1	0.2	0.1	0.5	0.5	0.5	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1	0.5
ES2107291	GW03	1/03/2021	water	441	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	-	<0.5
	QA01	1/03/2021	water	445	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	-	<0.5
RPD				1	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
ES2107291	GW03	1/03/2021	water	441	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	-	<0.5
777969	QA01A	1/03/2021	water	410	<0.1	<0.1	<0.1	<0.2	<0.1	<2	-	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<1	<2
RPD				7	0	0	0	0	0	0	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0

***RPDs have only been considered where a concentration is greater than 1 tim**
****Elevated RPDs are highlighted as per QAQC Profile settings (Adopted RPDs**
*****Interlab Duplicates are matched on a per compound basis as methods vary**

				OPP																			
				Bromophos-ethyl	Carbophenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Disulfoton	Ethion	Fenamiphos	Fenitrothion	Fenthion	Malathion	Methyl parathion	Monocrotophos	Parathion	Phorate	Pirimphos-ethyl	Prothiofos	Ronnel
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2	0.5	0.5	2	0.5	0.5	2	2	2	2	0.5	0.5	2
Lab Report Number	**Field ID**	**Date**	**Matrix Type**																						
ES2107291	**GW03**	**1/03/2021**	**water**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<2.0	<2.0	<2.0	-	<0.5	<0.5	-
	QA01	**1/03/2021**	**water**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<2.0	<2.0	<2.0	-	<0.5	<0.5	-
RPD				0	0	0	0	0	0	0	0	0	-	0	0	-	0	0	0	0	0	-	0	0	-
ES2107291	**GW03**	**1/03/2021**	**water**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<2.0	<2.0	<2.0	-	<0.5	<0.5	-
777969	**QA01A**	**1/03/2021**	**water**	-	-	<2	<20	<2	-	<2	<2	<2	<2	<2	-	<2	<2	<2	<2	<2	<2	<2	-	-	<2
RPD				-	-	0	0	0	-	0	0	0	-	0	-	-	0	0	0	0	0	-	-	-	-

***RPDs have only been considered where a concentration is greater than 1 tim**
****Elevated RPDs are highlighted as per QAQC Profile settings (Adopted RPDs**
*****Interlab Duplicates are matched on a per compound basis as methods van**

APPENDIX G

CALIBRATION CERTIFICATES

Oil / Water Interface Meter

Instrument **Geotech Interface Meter (30M)**
Serial No. **3909**

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	Black tape mid-way through
Connectors	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: **Ashok Hettigama**

Calibration date: **26/02/2021**

Next calibration due: **27/04/2021**

Multi Parameter Water Meter

Instrument **YSI Quatro Pro Plus**
Serial No. **17B100729**

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.00		355072	pH 7.07
2. pH 4.00		pH 4.00		351412	pH 4.09
3. pH 10.00		pH 10.00		355386	pH 9.79
3. mV		234.0mV		358632/358634	234.1 mV
4. EC		2.76mS		350510	2.75mS
5. D.O		0.00ppm		19059	0.00ppm
6. Temp		20.0°C		MultiTherm	20.1°C

Calibrated by: **Kylie Rawlings**

Calibration date: **26/02/2021**

Next calibration due: **28/03/2021**

APPENDIX H

GEOTECHNICAL INTERPRETIVE REPORT

Design
for a better
future /

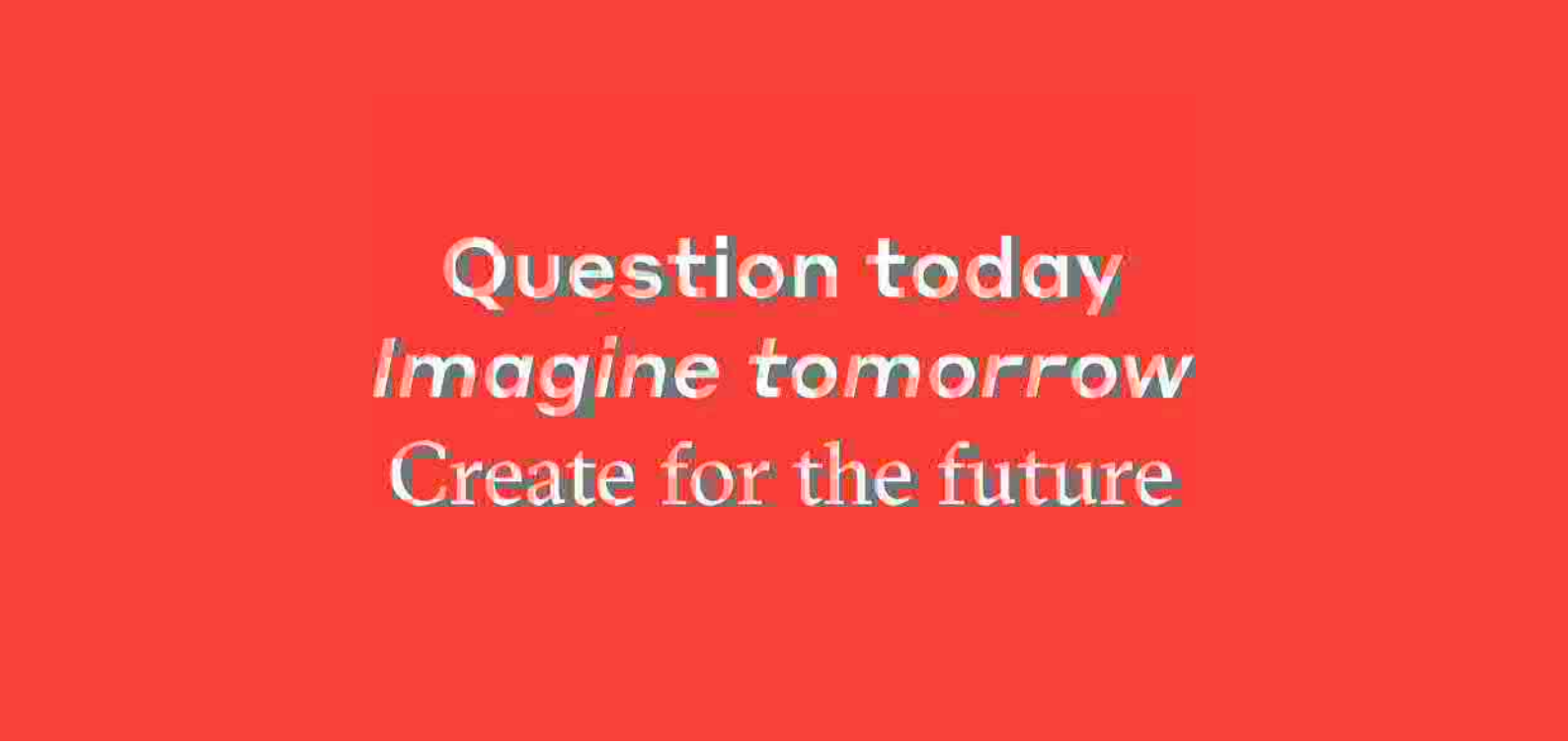
CONCRETE ESTATES PTY LTD C/- EMKC

GEOTECHNICAL INTERPRETIVE REPORT

2/65 DUNHEVED CIRCUIT, ST MARYS NSW 2760

wsp

MARCH 2021



Geotechnical Interpretive Report
2/65 Dunheved Circuit, St Marys NSW 2760

Concrete Estates Pty Ltd C/- EMKC

WSP
Level 27, 680 George Street
Sydney NSW 2000
GPO Box 5394
Sydney NSW 2001

Tel: +61 2 9272 5100
Fax: +61 2 9272 5101
wsp.com

REV	DATE	DETAILS
A	29/03/2021	Draft Geotechnical Interpretive Report
B	31/03/2021	Final Geotechnical Interpretive Report

	NAME	DATE	SIGNATURE
Prepared by:	Harry Wang/Casey Janssen	31/03/2021	
Reviewed by:	Gareth Evans	31/03/2021	
Approved by:	Gareth Evans	31/03/2021	

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1 PROJECT BACKGROUND

1.1 INTRODUCTION

WSP Australia Pty. Ltd. (WSP) was engaged by EMKC Pty. Ltd. (EMKC) to conduct a combined detailed geotechnical and environmental (contamination) site investigation of the property located at 2/65 Dunheved Circuit, St Marys NSW 2170 (the 'Site'). WSP understands the site is being acquired for construction of a 5,000 m^2 warehouse and logistics facility. WSP was engaged to identify any potential geotechnical constraints at the site, in the context of the proposed acquisition and development including the extent of contamination (if any) that may be present. The environmental/contamination assessment was undertaken by WSP's Contaminated Land Management (CLM) group and results are provided in the body of the lead report under this cover.

1.2 SCOPE

In accordance with the scope provided to EMKC in the document titled PP126479-CLM-PRP-001-STMARYS_RevA dated 10 February 2021, the geotechnical site investigation addresses the following:

- Five (5) x boreholes; three drilled to a depth of 8 m with continuous flight augers or prior refusal and two advanced by rock coring with HQ3 coring method (to a maximum depth of 10 mBGL). Standard Penetrometer Testing (SPT) were undertaken at 1.0 or 1.5 m intervals to assess soil strength and samples collected for laboratory testing.
- An experienced geotechnical engineer from WSP supervised the field investigation and logged each borehole in accordance with AS1726-2017 'Geotechnical Site Investigations'. Observations regarding potential staining, odours or contamination were made to support environmental reporting.
- Borehole co-ordinates were provided in MGA94 format for each borehole using a hand-held GPS.
- The groundwater was observed within the boreholes and the level was recorded in the log.
- Conversion of three selected holes into groundwater monitoring wells.
- Disturbed bulk samples were collected from adjacent test pits (carried out by our CLM team) for California Bearing Ratio (CBR) testing.
- Pocket penetrometer (PP) testing were completed on cohesive soil samples recovered from the SPT. Results are shown on the logs at the relevant depths.
- Boreholes were backfilled with spoil from the hole to the same level as existing ground.

1.3 PURPOSE OF THIS REPORT

This report has been prepared to collate and interpret relevant geotechnical information for the site to enable recommendations to be made for the proposed warehouse development.

The report includes a review of regional geology, site topography and geotechnical information derived from the geotechnical investigation and provides recommendations for:

- Geotechnical design parameters.
- Foundation and pavement design.
- Batter and bench construction.

2 SITE CHARACTERISATION

2.1 LOCATION AND SITE TOPOGRAPHY

The site is located off 2/65 Dunheved Circuit, St Marys, approximately 45 km west-northwest (WNW) of Sydney CBD, as shown in Figure 1, Attachment A. The site comprising approximately 5,000 m^2. Medium-scale industrial estate makes up a majority of the local surrounds (to the north and east of the property) with Dunheved Golf Club to the west. A densely vegetated area borders the site to the south. The site has been graded to a relative flat level and is variously sparsely vegetated and densely vegetated with grass and weeds. The north-east corner of the site comprises a hardstand area approximately 75 m x 120 m.

2.2 REGIONAL GEOLOGY

Review of the 1:100,000 Penrith Geological map (NSW Department of Minerals and Energy, 1991), for the St Marys area indicates the site is likely to be underlain by Tertiary and Quaternary period fluvial material and Londonderry Clay. These geological formations are described as follows:

- Qal: Fine-grained sand, silt and clay.
- Ti: Londonderry Clay: Clay, patches of ferruginised, consolidated sand.

A boundary between fluvial material (denoted as Qal) and the Londonderry Clay (denoted Ti) is indicated on the map and approximately runs through the western portion of the site. An extract from the geological map is shown in Figure 2.1; the approximate location of the site is denoted with a placemark.

Subsurface fluvial materials are those which are found in the vicinity of rivers and creeks. The expected fluvial material noted on the geological map is likely associated with historical deposits transported via South Creek, also shown in Figure 2.1, which winds north to south approximately 500 m to the west of the site.

Review of the Australian Stratigraphic Units Database (accessed 8 September 2020) defines Londonderry Clay unit as being ‘moderately to highly plastic clay, sand, ironstone pisolites and aggregates of sand and clay’. It is also expected that this unit is likely underlain by Rickabys Creek Gravel and Bringelly Shale (at depth).

Through consolidating the above information, a preliminary natural subsurface profile, which may be encountered at the site is as follows:

- Fluvial material including fine-grained silt, sand and clay; overlying.
- Londonderry Clay typically comprising moderately to highly plastic clay with sand and iron cemented sandy clay aggregates; overlying.
- Rickabys Creek Gravel and Bringelly Shale formations at depth.

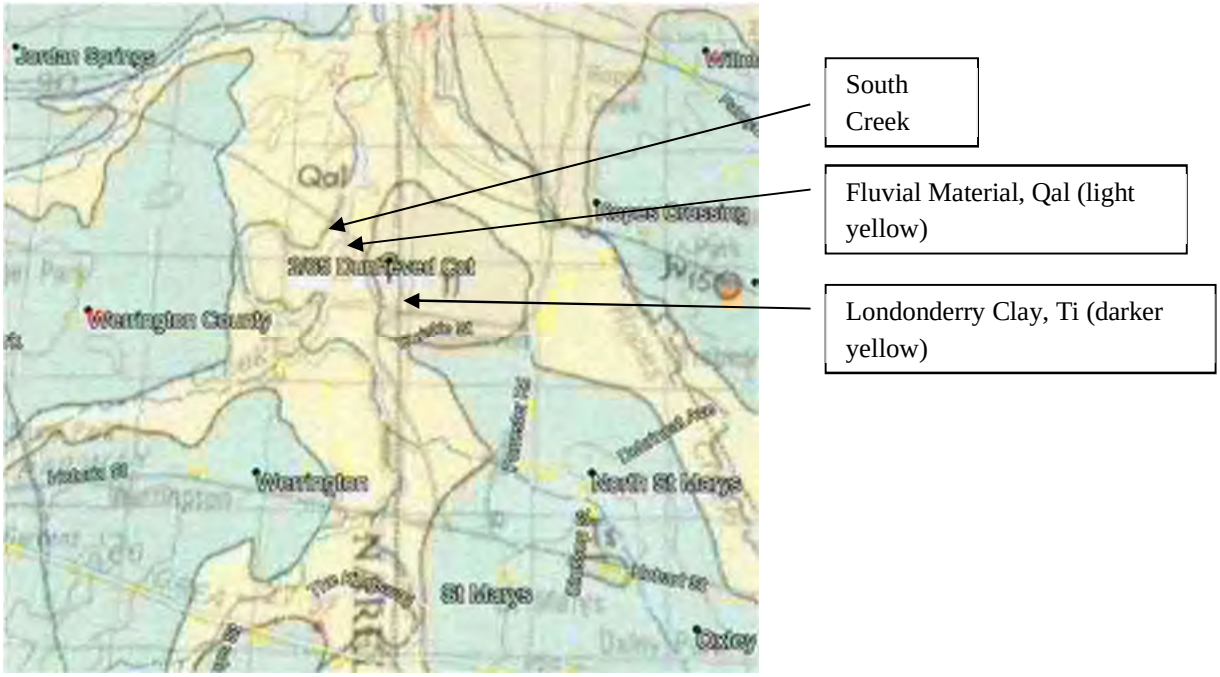


Figure 2.1 Excerpt from 1:100,000 Penrith Geological Map

2.3 ACID SULFATE ROCK AND SOILS

Acid sulfate soils (ASS) are acidic soil horizons or layers resulting from the aeration of soil materials that are rich in iron sulphides, primarily pyrite (FeS2). They are generally likely to be present in:

- Marine and estuarine sediments of the recent (Holocene) geological age.
- In soils, usually not more than five metres above mean sea level.
- In marine or estuarine settings.

When drainage or excavation brings air into these previously waterlogged soils, the pyrite is oxidised to produce sulfuric acid. The acid reacts with clay minerals and dissolves metals in the soil such as iron and aluminium. The resulting acid and dissolved metals that leach from the soil are often toxic to flora and fauna.

Acid sulphate rock (ASR) includes diverse lithologies that contain sulphide and sulphate minerals (commonly pyrite) and based on experience is known to occur in the lower stratigraphic sequences of the Sydney Basin and other areas of New South Wales. ASR are unlikely to be present in the project area.

According to the National Acid Sulphate Soils Atlas and CSIRO ASRIS website (http://www.asris.csiro.au/), accessed 11 September 2020, the site is given a rating of C4: Extremely low probability/very low confidence, which is defined as: 1 – 5% chance of occurrence in mapping unit with any occurrences in small localised areas, no necessary analytical data available and classifier has little knowledge or experience with ASS, hence classification is provisional.

However, it is possible that there may be some areas where ASS could exist across site, particularly in areas of shallow groundwater (if encountered). It is recommended that the presence of ASS is further assessed as part of an environmental investigation.

3 GEOTECHNICAL INVESTIGATION

3.1 OVERVIEW

The geotechnical investigation was completed over three days on Wednesday 24th February 2021 to Friday 26th February 2021 and comprised:

- Three (3) augered boreholes (BH01, BH03, BH04) to 7 mBGL with associated Standard Penetrometer Testing (SPT) and Pocket penetrometer (PP) testing.
- Two (2) augered / cored boreholes (BH02, BH05) to 10 mBGL with associated rock core Point Load Testing (PLT).
- Three (3) groundwater monitoring well were installed in the selected boreholes (BH03, BH04, BH05).

A summary of the completed geotechnical investigation locations is presented in Table 3.1. Investigation locations are further summarised in **Error! Reference source not found.**. Engineering logs, including SPT, PP and PLT results are presented in **Error! Reference source not found.**.

Table 3.1 Summary of completed geotechnical investigation

TYPE	INVESTIGATION ID	EASTING	NORTHING	REDUCED LEVEL (mAHD[1])	TERMINATION DEPTH (mBGL[2])	TERMINATION REASON
Augered Boreholes	BH01	293053	6263930	28	6.9	Refusal
	BH03	293008	6263860	26	7.0	Target Depth
	BH04	293086	6263894	27	7.0	Target Depth
Augered / Cored Boreholes	BH02	292999	6263901	25	10.0	Target Depth
	BH05	293107	6263816	26	10.0	Target depth

1 – Australian Height Datum

2 – Below Ground Level

3.2 INVESTIGATION METHODOLOGY

3.2.1 PRELIMINARIES

The geotechnical investigation was undertaken in accordance with the approved Health Environment and Safety Plan (HESP), WSP Ground Penetration Permits and Contractor WHS Induction.

3.2.2 SERVICE LOCATION

Prior to attending site, a dial-before-you-dig service search was completed and service plans for potential services collected. To determine the presence of underground services, a combination of scanning techniques was used, including a ground penetrating radar (GPR) scan and electrical resistance tomography (ERT).

The proposed cored borehole investigation locations were identified to be clear of underground utilities prior to the commencement of breaking ground.

3.2.3 SET-OUT AND SURVEY

Easting and northing co-ordinates for all investigation locations were extracted from a handheld GPS unit (generally accurate to approximately +/- 3 m) in Map Grid Australia (GDA 94) Zone56 format. Reduced Levels (RLs) were inferred from GPS readings.

Approximate coordinates and RLs of the investigation locations are presented in Table 3.1.

3.2.4 FIELDWORK

All field work was managed by an experienced WSP geotechnical engineer who was responsible for supervising drilling activities, soil and rock logging, collecting samples, directing in-situ testing and preparing engineering logs. All augered and cored boreholes were drilled using a DB8 drilling rig. A solid flight auger fitted with a V-bit was used to drill through soil. BH02 and BH05 were subsequently advanced with triple tube diamond HQ3 coring in rock.

To assess the soil strength and consistency or density of the subsurface strata, and to obtain further soil samples, Standard Penetration Tests (SPTs) were carried out in accordance with AS1289.6.3.1-2004, at nominal 1.0 – 1.5 m intervals, starting at a depth of 1.0 m below existing ground level. Pocket penetrometer (PP) testing was completed on SPT samples. Point Load Tests were carried out on recovered rock core samples at approximately 0.5-1.5m intervals, to provide an indication of the unconfined compressive strength of the rock. Groundwater monitoring wells were installed in boreholes BH03, BH04, BH05 with monument casing. Boreholes were backfilled with excess drilling spoil and grout.

All geotechnical investigation work was carried out in accordance with AS1726-2017 ‘Geotechnical Site Investigations’, where applicable.

4 GEOTECHNICAL ASSESSMENT

4.1 SUBSURFACE CONDITIONS AND GROUND MODEL

Based on the results of the geotechnical investigation, the geology identified across the site is consistent with the regional geology indicated by the 1:100,000 Penrith Geological map. The ground profile across the site extents can be generally summarised as follows:

— Fill, typically comprising sandy gravel and gravelly clay, overlying.

— Residual Soils, typically comprising silty/sandy clay, overlying.

— Weathered Rock (inferred Bringelly Shale) ranging from low to medium strength, highly to slightly weathered.

For geotechnical characterisation of the sub-surface conditions and to inform engineering design, the soil and rock types encountered across the site extents have been generalised into the Geotechnical Units presented in Table 4.1. The depth and thickness of the Geotechnical Units summarised are limited to the extents of the geotechnical investigation.

Table 4.1 Summary of subsurface conditions and inferred ground model

GEOTECHNICAL UNIT	GENERALISED DESCRIPTION	DEPTH TO TOP OF UNIT (mBGL)	THICKNESS (m)
1.Fill (BH01, BH02, BH03)	Sandy Gravel / Gravelly Clay Fine to coarse grained gravel Sub-angular sub-rounded Medium to high plasticity clay Fine to medium grained sand Brown to grey	0	0.8 to 0.9
2. Residual Soil	Silty/Sandy Clay Medium to High plasticity Fine grained sand Pale grey mottled red/orange	0.2 to 0.9	4.1 to 5.7
3a. Weathered Rock	Extremely weathered Very low strength Grey to brown Recovered as Silty Clay	5.0 to 6.0	1.8 to 3.1
3b. Weathered Rock (BH02, BH05)	Highly to slightly weathered Low to medium strength Pale grey/brown to dark grey Class III Shale and Laminite	7.4 to 8.4	Not Penetrated. Drilled to max. depth of 10.00

Rock classes assessed in accordance with Pells et all (2019) “Classification of Sandstones and Shales in the Sydney Region: A Forty Year Review”, June 2019.

4.2 GROUNDWATER

Review of the Australian Bureau of Meteorology Groundwater Exploration Database (accessed 11 September 2020), including historical bores in the vicinity of the site, indicates that groundwater has previously been encountered at shallow depth, about 1.5 mBGL.

Groundwater was encountered during V-bit augering except BH05 and groundwater monitoring wells were installed in BH03, BH04 and BH05 following completion of drilling. The groundwater level encountered and monitoring well details are listed in Table 4.2.

It should be noted groundwater levels may vary due to climatic and seasonal conditions and therefore, the observations at the time of the geotechnical investigation may not represent the long-term groundwater conditions or conditions that may be encountered during construction phases.

Table 4.2 Groundwater levels and monitoring well installation summary

BOREHOLE ID	GROUNDWATER LEVEL ENCOUNTERED (mBGL)	BOTTOM OF GROUNDWATER MONITORING WELL (mBGL)	GROUNDWATER MONITORING WELL SCREEN (m)
BH01	5.3	N/A	N/A
BH02	3.5	N/A	N/A
BH03	5.0	7	3
BH04	5.0	7	3
BH05	Not Encountered	7	4

4.3 LABORATORY TESTING

Selected disturbed soil samples were collected from the boreholes and sent to Resource Laboratories Pty Ltd (Resource Labs), a NATA-accredited soil laboratory. Scheduled lab tests are listed in Table 4.3 with laboratory test certificates provided in Attachment C.

Table 4.3 Geotechnical laboratory testing schedule

LAB TEST	BOREHOLE ID	SAMPLE DEPTH (mBGL)	DATE SAMPLED
Moisture Content (AS 1289.2.1.1)	BH02	1.00-1.45	25/02/2021
	BH04	3.00-3.45	24/02/2021
	BH05	4.00-4.45	24/02/2021
Atterberg Limits (LL, PL, PI and LS) (AS 1289.3.1.2, 3.2.1, 3.3.1; AS 1289.3.4.1)	BH01	2.50-2.95	26/02/2021
	BH03	2.50-2.95	25/02/2021
	BH05	2.00-2.45	24/02/2021
CBR (4-day soak) AS 1289.6.1.1 4.5 kg Surcharge, Remoulded ratio @ 98%	BH01	1.00-1.20	26/02/2021
	BH03	2.00-2.20	25/02/2021

LAB TEST	BOREHOLE ID	SAMPLE DEPTH (mBGL)	DATE SAMPLED
PSD (AS1289.3.6.1)	BH02	2.50-2.95	25/02/2021
Soil Aggressivity (pH, SO4, CI) (APHA)	BH03	4.00-4.45	25/02/2021
	BH04	1.00-1.45	24/02/2021
	BH05	1.00-1.45	24/02/2021
Linear Shrinkage (1289.3.4.1)	BH01	5.50-5.95	26/02/2021
	BH02	4.00-4.45	25/02/2021
	BH05	5.00-5.45	24/02/2021

4.3.1 GEOTECHNICAL TEST RESULTS

Geotechnical laboratory test results are provided in Table 4.4 to Table 4.7.

Table 4.4 Moisture content test results

BOREHOLE ID	SAMPLE DEPTH (mBGL)	MATERIAL	MOISTURE CONTENT, MC (%)
BH02	1.00-1.45	Silty CLAY	15.7
BH04	3.00-3.45	Silty CLAY	15.4
BH05	4.00-4.45	Silty CLAY	15.3

Table 4.5 Atterberg Limits test results

BOREHOLE ID	SAMPLE DEPTH (mBGL)	MATERIAL	USCS SYMBOL	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	LINEAR SHRINKAGE (%)
BH01	2.50-2.95	Silty CLAY	CL-CI	37	12	25	14.0
BH01	5.50-5.95	Silty CLAY	-	ND	ND	ND	11.0
BH02	4.00-4.45	Silty CLAY	-	ND	ND	ND	13.5
BH03	2.50-2.95	Silty CLAY	CL-CI	36	12	24	14.5
BH05	2.00-2.45	Silty CLAY	CL	34	12	22	10.0
BH05	5.00-5.45	Silty CLAY	-	ND	ND	ND	14.5

USCS = Unified Soil Classification System

ND = Not Determined

Table 4.6 CBR test results

BOREHOLE ID	SAMPLE DEPTH (mBGL)	MATERIAL	MAXIMUM DRY DENSITY (t/m^3)	OPTIMUM MOISTURE CONTENT, OMC (%)	CBR (%)
BH01	1.00-1.20	Silty CLAY; with sand and gravel	1.90	12.8	6.0
BH03	2.00-2.20	Silty CLAY; trace gravel	1.60	22.8	4.0

Table 4.7 PSD test results

			PERCENTAGE PASSING SIEVE SIZE (mm)				
BOREHOLE ID	SAMPLE DEPTH (mBGL)	MATERIAL	0.600	0.425	0.300	0.150	0.075
BH02	2.50-2.95	Silty CLAY	100	99	98	83	61

4.3.2 CHEMICAL TEST RESULTS

Soil chemical laboratory test results are provided in Table 4.8.

Table 4.8 Chemical laboratory test results

BOREHOLE ID	SAMPLE DEPTH (mBGL)	pH	SULPHATE (SO_4^{2-}) (mg/kg)	CHLORIDE (mg/kg)	MOISTURE CONTENT (%)
BH03	4.00-4.45	5.3	40	1040	12.3
BH04	1.00-1.45	4.9	120	640	11.8
BH05	1.00-1.45	4.7	70	750	11.9

4.4 GEOTECHNICAL DESIGN PARAMETERS

A set of engineering geotechnical design parameters have been developed for the adopted Geotechnical Units across the site extent. These properties are representative values typical of the geotechnical conditions encountered at the site. The design parameters have been developed based on interpretation of all geotechnical investigation results, consideration of published correlations and engineering judgement.

During construction phases, all materials encountered should be inspected, compared, and verified with the parameters adopted during the design process by an experienced geotechnical engineer.

The soil design parameters presented in Table 4.9 are intended for use with Ultimate Limit State (ULS) and Serviceability Limit State (SLS) design approaches, using appropriate design standards with associated strength reduction and load factors applied accordingly.

Table 4.9 Summary of geotechnical design parameters for adopted geotechnical units

GEOTECHNICAL UNIT	CONSISTENCY / STRENGTH	BULK UNIT WEIGHT γ (kN/m^3) [1]	UNDRAINED SHEAR STRENGTH CU (kPa) [2]	EFFECTIVE COHESION C' (kPa) [2]	EFFECTIVE FRICTION ANGLE Ø' (DEG) [2]	DRAINED POISSON RATIO v' [2]	ELASTIC MODULUS E' (MPa) [2]
1[3]	Variable	18	-	-	35	-	-
2	Stiff to Very Stiff	19	150	7	27	0.3	15
3a	Very low	22	250	10	30	0.3	75
3b	Low to Medium	24	N/A	25	32	0.2	400

1. Bulk unit weight inferred from Table D1, Appendix D AS4678: 2002 (Earth Retaining Structures).

2. Values based on published literature and engineering judgement with similar materials.

3. Fill material is inherently unsuitable and would typically be removed and replaced as per Section 5.1 of this report. However, select preliminary geotechnical parameters have been provided to allowing retaining wall back analysis, where appropriate.

4.5 SITE CLASSIFICATION

Site classification in accordance with AS2870-2011 (Residential Slabs and Footings) is based on the expected ground surface movements and depth to which the movements extend. Sites where ground movement is predominantly due to soil reactivity under normal conditions are classified from lowest to highest reactivity (Classes A, S, M, H1, H2 to E). Although not fully applicable to the design of commercial developments as per the site redevelopment, an assessment in accordance with AS2870-2011 provides an indicative framework for foundation design.

Based on the subsurface profile encountered and with reference to Table 2.1 of AS2870-2011 the site could reasonably be taken to have a soil reactivity classification of M based on a clayey residual soil profile between 0.2 m and 6.0 m over weathered rock. This means that the site soil could experience moderate ground movement from moisture changes. Ground surface movements are expected to be in the range of 20 mm to 40 mm for a class M site.

It is worth noting also that due to the presence of FILL encountered during the investigations, assessments also show that the site soil reactivity could be defined as Class P (problem site).

4.6 DURABILITY ASSESSMENT

Following receipt of the soil chemical test results, an assessment was undertaken to provide a durability classification in accordance with AS 2159 – 2009 *Piling – Design and installation.*

An exposure classification has also been assessed in accordance with AS 3600 – 2009 *Concrete structures.*

Based on chemical laboratory test results, an exposure classification for concrete of "mild" is recommended in accordance with AS 2159-2009. An exposure classification of "non-aggressive" is also recommended for steel.

In accordance with AS 3600-2009, an exposure classification of B1 is recommended for buried concrete.

4.7 EARTHQUAKE SITE CLASSIFICATION

AS/NZS 1170-2007 Part 4 *Earthquake actions in Australia* requires designers to consider the effects of earthquakes. The design is influenced by a hazard factor (based on the probability of an earthquake occurring) and the classification of the site (based on the subsoil strength and thickness).

The hazard factor (Z) for this site should be taken as 0.08 as per Table 3.2 of AS/NZS 1170.4, which is the nominated value for the region encompassing the site. The hazard factor quoted in the standard is based on a 1 in 500-year probability of exceedance.

The site sub-soil classification recommended for this site is C_e (Shallow soil site) as per Section 4 of AS/NZS 1170.4.

5 DISCUSSION & RECOMMENDATIONS

5.1 EARTHWORKS & CONSTRUCTABILITY

All excavation work should be carried out in accordance with the Safe Work Australia publication, Excavation Work Code of Practice, October 2018 and NSW Government publication Code of Practice Construction Work, August 2019.

5.1.1 SITE PREPARATION

Geotechnical Unit 1, inherently unsuitable material should be removed off site and/or stripped and stockpiled for reuse as landscaping (non-engineered) material, as appropriate. Additional unsuitable material, potentially not identified during the geotechnical investigation, may include man-made waste, perishable materials, other organics and any materials with a California Bearing Ratio (CBR) value less than 1% (CBR < 1). Such materials should be excavated, further stockpiled and/or disposed off-site in general accordance with NSW Environmental Protection Authority (EPA) Waste Classification Guidelines.

As part of construction, the site should be suitably cleared and grubbed, with temporary drainage provided to manage surface run-off and potential inflows. Where exposed, temporary protection should be provided for exposed soil slopes to prevent erosion and loss of topsoil.

During construction, inspection by a suitably qualified geotechnical engineer or engineering geologist should be sought to verify the geotechnical conditions across the site, to identify any localised zones of poor, unsuitable or fractured material.

5.1.2 EXCAVATABILITY OF SITE MATERIALS

Excavation of fill (Geotechnical Unit 1), residual soils (Geotechnical Unit 2) and extremely weathered rock (Geotechnical Unit 3a) will be achieved using conventional earthmoving plant such as excavators with straight-blade or toothed buckets.

Geotechnical Unit 3b is expected to range from easy to hard ripping. The use of hydraulic rock breakers may be required at depth. It is noted no major excavations are currently planned as part of the site redevelopment works, therefore use of rock breakers are not currently anticipated.

It is recommended that the engaged contractors examine the engineering logs to make their own assessment of the required excavation plant and production rates prior to breaking ground.

5.1.3 BATTERS AND BENCHING

Based on the proposed site development, cut slopes and/or excavations may encounter Geotechnical Units 1 to 3a. Due to its inherent unsuitability and heterogeneous nature, fill materials should not be incorporated into unsupported batter slopes and removed in accordance with the recommendations in Section 5.1.1 of this report.

Residual soils (Geotechnical Unit 2) are expected to remain stable at long-term batter slopes of approximately 1V:2H or shallower. Geotechnical Unit 3a is expected to be stable at an unsupported cut angle of up to 1V:1.5H. Preliminary design recommendations for unsupported temporary (short term) or permanent (long term) cut slopes are presented in Table 5.1. Cut slopes shall be subject to appropriate stability analysis and designed to meet the factor of safety requirements of 1.3 and 1.5 for short and long term respectively, during detailed design phases.

Care should be taken to avoid surcharge loading adjacent to the excavation, including excavated spoil and plant and equipment (refer to the Excavation Work Code of Practice).

If groundwater inflows are encountered, a sump should be formed at the base of the excavation and the water pumped out.

Table 5.1 Temporary and permanent batter slopes

GEOTECHNICAL UNIT	CONSISTENCY / STRENGTH	CUT SLOPE BATTER	
		PERMANENT	TEMPORARY
2	Stiff to very stiff	1V: 2H	1V: 1.5H
3a/3b	Very low strength	1V: 1.5H	1.V: 0.75H

A minimum 0.5 m wide bench should be incorporated at maximum 1.5 m of excavation.

If the site boundary prevents application of the above recommended safe batter slopes, consideration should be given to:

- Use of a 1:1 batter slope incorporating a minimum 0.5 m wide bench at a depth of 1.0 m and every 1.5 m of excavation thereafter.
- Retaining structures, if required would typically include concrete solider piles or post and panel walls with timber/steel/concrete walers, or sheet piles to support temporary excavations.

All excavations (deeper than 1.5 m) should be observed by a geotechnical engineer or engineering geologist, who shall assess safe batter angles appropriate for the conditions encountered. Where access is required for a worker, the need (or otherwise) for support of the temporary excavation should be assessed on-site by a geotechnical engineer or engineering geologist.

Supports could include retaining structures (shoring) and/or use of trench shields to protect workers within the excavation.

If a period of heavy rainfall occurs during construction, the stability of the excavation should also be reassessed prior to recommencement of work. If the exposed soils have softened significantly due to an increase in moisture content, then temporary shoring or other approaches may be required to support excavations. Protective plastic sheeting can be used to protect the batters if heavy rainfall is predicted before the excavation is backfilled or the clay surface smoothed using the excavator bucket to reduce infiltration and softening of the soils.

5.2 FOOTING AND PAVEMENT DESIGN RECOMMENDATIONS

5.2.1 FOUNDATIONS

Foundation options will depend on the structural loading and the ability of the structure to accommodate some movement. For example, steel framed warehouse type buildings can typically accommodate greater movement compared with a concrete framed and or brick walled structures.

Options to be considered include:

- Pad footings - founded on the stiff to very stiff alluvial or residual soils, where bearing pressures of 150 kPa can be supported with settlements of around 1% of the footing width.
- Pile footings - extending into the weathered shale bedrock where bearing pressures over 1 MPa are required and settlements of 1% of the pile diameter can be accommodated.
- Stiffened raft slab – where differential settlements need to be minimised and structural and or operational loads need to be spread. Where this option is used a capping layer of imported granular fill should be placed beneath the slab to provide an even bearing surface over the reworked clay platform. The depth of this capping layer needs to be assessed by the geotechnical/ structural engineer once the building design and loads are known with more certainty. Typically, a 300 mm to 500 mm thickness of granular fill would be required beneath the slab.

— Combination of individual footings and slab on ground – This option would consist of using pad footings as discussed above with a floating concrete slab. The slab would need to be constructed above a capping layer of granular imported material as described for the stiffened raft slab.

The estimated allowable bearing capacities outlined above are dependent on the foundation subgrade being inspected by a suitably qualified geotechnical engineer to verify that ground conditions are consistent with design assumptions, founding surfaces are clean from spoil and other soft and loose materials, and free from water to allow concrete placement. Proof rolling of the foundation subgrade (soils only) should be conducted and if visible deformation is observed or unsuitable material is encountered at foundation level, the affected material/area should be over-excavated and replaced with suitable material.

Any engineered fill used as replacement material or to support high level building footings should be placed, compacted and tested under level 1 supervision in general accordance with AS3798: 2007 (Guidelines for earthworks for commercial and residential developments).

5.2.2 PAVEMENT

Based on a review of the EMKC proposed site plan (ref: 100285 SM DA01 002 Rev A, dated 15 December 2020), we understand pavement is required for the car parking and freight drop off/pick up areas. Consideration will need to be given during design to the difference in loading requirements between the two pavement areas including type of vehicles, frequency of movement and design life, speed limits.

Based on the site investigation and laboratory test results, a design CBR value of 3% is recommended for pavement design across the site, assuming the clay subgrade is the final surface layer. This value is consistent with a moderately poor-quality subgrade requiring deeper layers of imported sub-base and base materials. It is recommended that the subgrade is inspected by a geotechnical engineer and proof rolled to identify any soft spots prior to the placement of any pavement material. There may be a requirement to excavate soft material or uncontrolled fill and replace with an imported granular engineered fill at some locations.

The laboratory tests have indicated that the reactive clay present at the site has a linear shrinkage (LS) value of between 10.0% and 14.5%. Typically, material with a LS value greater than 7% would require special consideration beneath pavements to prevent loss of bearing capacity resulting in rutting and surface cracking. This could include treatment of the clay subgrade using lime stabilisation or use of deeper sub-base.

Particular attention should be given to site drainage to avoid accumulation or ponding of water as this will compromise the bearing capacity of the pavement if it penetrates cracks leading to further damage.

6 CONCLUSIONS

It is important to note that there are no geotechnical showstoppers identified at this site that would constrain future development of the proposed warehouse facility, although design measures and ground treatments necessary to accommodate the site conditions will have a cost implication.

The investigation has confirmed that special engineered solutions as discussed in this report will be required to address the reactive clay soils which are prone to movement (shrink and swell) under seasonal changes in moisture content.

Warehouse footings should not be founded in the fill but rather taken down to natural soils or rock. Similarly, unsuitable material shall be removed from hardstand/pavement placement areas to aid in achieving a competent subgrade surface.

7 REFERENCES

- Acid Sulfate Soil Management Advisory Committee (ASSMAC) 1998, Acid Sulfate Soil Manual.
- Australian Standard AS1289 – 2009: Methods of Testing Soils for Engineering Purposes, Standards Australia.
- Australian Standard AS1726 – 2017: Geotechnical Site Investigations, Standards Australia.
- Australian Standard AS2159 – 2009: Pile Footings Design and Installation, Standards Australia.
- Standards Australia, AS3798 – 2007: Guidelines for Earthworks for Commercial and Residential Developments,
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- Geological Survey of NSW, 1983, Sydney Geological Series Sheet 9130, 1: 000,000.
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- NSW EPA 2014b, Waste Classification Guidelines. Part 4: Acid Sulfate Soils.
- Pells, P. J. N., Mostyn, G., Bertuzzi, R. and Wong, P. K. (2019), Classification of sandstones and shales in the Sydney region: A forty year review, Australian Geomechanics, Vol 54(2), pp 29-55.
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- Safework Australia, *Excavation Work – Code of Practice*, dated October 2018.
- Safework NSW, *Code of Practice – Construction Work*, dated August 2019.
- Standards Australia, AS5100.3 – 2017: Bridge design, Part 3: Foundation and soil-supporting structures.

8 LIMITATIONS

SCOPE OF SERVICES

This geotechnical site assessment report (the report) has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the client and WSP (scope of services). In some circumstances, the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

RELIANCE ON DATA

In preparing the report, WSP has relied upon data, surveys, analyses, designs, plans and other information provided by the client and other individuals and organisations, most of which are referred to in the report (the data). Except as otherwise stated in the report, WSP has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report (conclusions) are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. WSP will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to WSP.

GEOTECHNICAL INVESTIGATION

Geotechnical engineering is based extensively on judgment and opinion. It is far less exact than other engineering disciplines. Geotechnical engineering reports are prepared to meet the specific needs of individuals. A report prepared for a consulting civil engineer may not be adequate for a construction contractor or even some other consulting civil engineer. This report was prepared expressly for the client and expressly for purposes indicated by the client or his/her representative. Use by any other persons for any purpose, or by the client for a different purpose, might result in problems. The client should not use this report for other than its intended purpose without seeking additional geotechnical advice.

THIS GEOTECHNICAL REPORT IS BASED ON PROJECT-SPECIFIC FACTORS

This geotechnical engineering report is based on a subsurface investigation, which was designed for project-specification factors, including the nature of any development, its size and configuration, the location of any development on the site and its orientation, and the location of access roads and parking areas. Unless further geotechnical advice is obtained, this geotechnical engineering report cannot be used:

- When the nature of any proposed development is changed.
- When the size, configuration location or orientation of any proposed development is modified.

This geotechnical engineering report cannot be applied to an adjacent site.

THE LIMITATIONS OF SITE INVESTIGATION

When assessing a site from a limited number of boreholes or test pits there is the possibility that variations may occur between test locations. Site exploration identifies specific subsurface conditions only at those points from which samples have been taken. The risk that variations will not be detected can be reduced by increasing the frequency of test locations; however, this often does not result in any overall cost savings for the project. The investigation program undertaken is a professional estimate of the scope of investigation required to provide a general profile of the subsurface conditions. The data derived from the site investigation program and subsequent laboratory testing are extrapolated across the site to form an inferred geological model and an engineering opinion is rendered about overall subsurface conditions and their likely behaviour with regards to the proposed development. Despite investigation the actual conditions at the site might differ from those inferred to exist, since no subsurface exploration program, no matter how comprehensive, can reveal all subsurface details and anomalies.

The borehole logs are the subjective interpretation of subsurface conditions at a particular location, made by trained personnel. The interpretation may be limited by the method of investigation and cannot always be definitive. For example, inspection of an excavation or test pit allows a greater area of the subsurface profile to be inspected than

borehole investigation, however, such methods are limited by depth and site disturbance restrictions. In borehole investigation, the actual interface between materials may be more gradual or abrupt than a report indicates.

SUBSURFACE CONDITIONS ARE TIME DEPENDENT

Subsurface conditions may be modified by changing natural forces or man-made influences. A geotechnical engineering report is based on conditions which existed at the time of subsurface exploration.

Construction operations at or adjacent to the site, and natural events such as floods, or groundwater fluctuations, may also affect subsurface conditions, and the continuing adequacy of a geotechnical report. The geotechnical engineer should be kept appraised of any such events and should be consulted to determine if additional tests are necessary.

AVOID MISINTERPRETATION

A geotechnical engineer should be retained to work with other appropriate design professionals explaining relevant geotechnical findings and in reviewing the adequacy of their plans and specifications relative to geotechnical issues.

BORE/PROFILE LOGS SHOULD NOT BE SEPARATED FROM THE ENGINEERING REPORT

Final bore/profile logs are developed by geotechnical engineers based upon their interpretation of field logs and laboratory evaluation of field samples. Customarily, only the final bore/profile logs are included in geotechnical engineering reports. These logs should not under any circumstances be redrawn for inclusion in architectural or other design drawings. To minimise the likelihood of bore/profile log misinterpretation, contractors should be given access to the complete geotechnical engineering report prepared or authorised for their use. Providing the best available information to contractors helps prevent costly construction problems. For further information on this matter reference should be made to ‘Guidelines for the Provision of Geotechnical Information in Construction Contracts’ published by the Institution of Engineers Australia, National Headquarters, Canberra 1987.

GEOTECHNICAL INVOLVEMENT DURING CONSTRUCTION

During construction, excavation is frequently undertaken which exposes the actual subsurface conditions. For this reason, geotechnical consultancy should be retained through the construction stage to identify variations if they are exposed, and to conduct additional tests, which may be required and to deal quickly with geotechnical problems if they arise.

REPORT FOR BENEFIT OF CLIENT

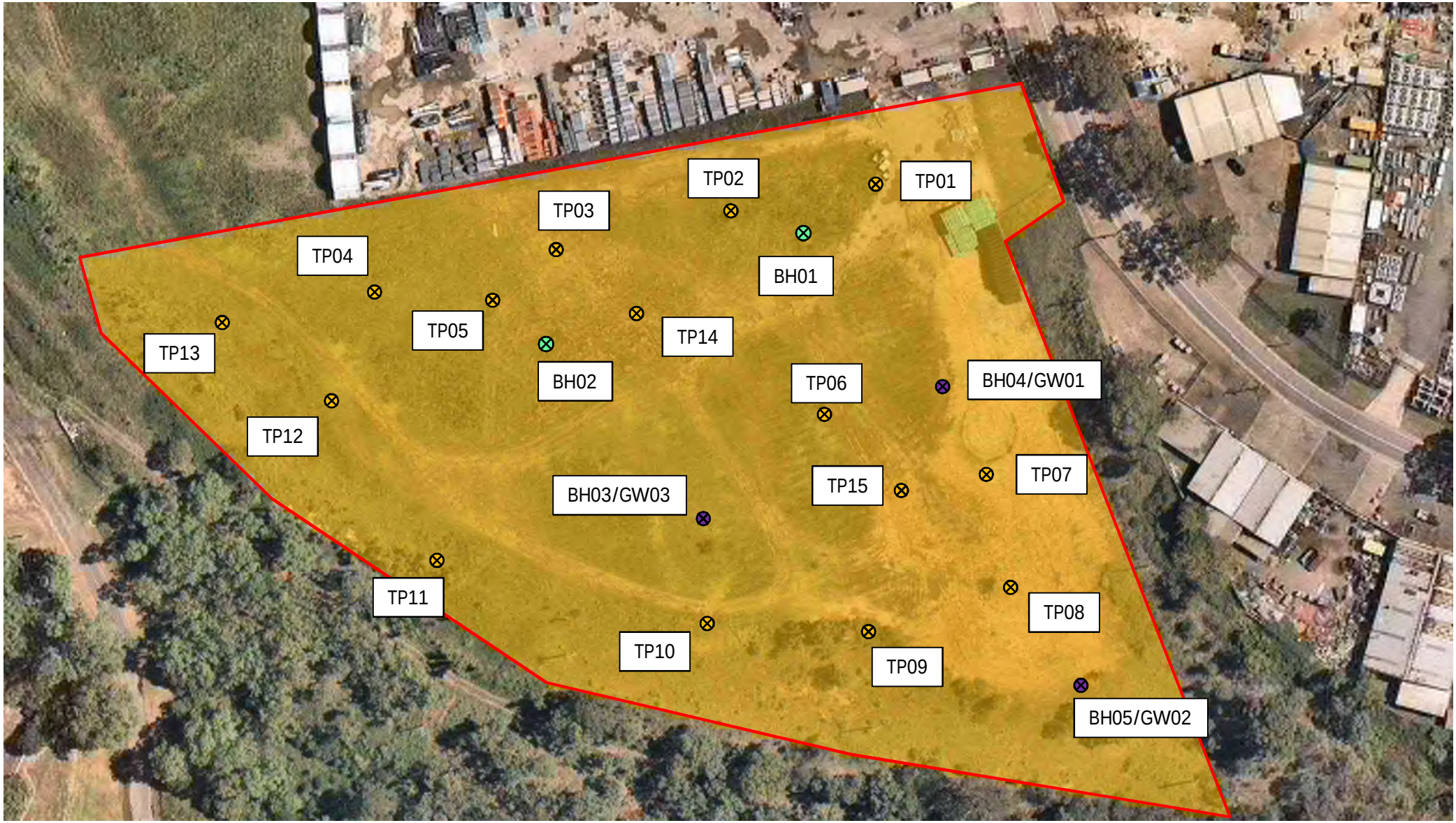
The report has been prepared for the benefit of the client and no other party. WSP assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of WSP or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

OTHER LIMITATIONS

WSP will not be liable to update or revise the report to consider any events or emergent circumstances or facts occurring or becoming apparent after the date of the report.

ATTACHMENT A

INVESTIGATION LOCATION PLAN



Test pit locations
Groundwater well locations
Borehole locations

Approximate site boundary

Source: n*earmap (2021)*

Figure 2 – Intrusive investigation locations

ATTACHMENT B

ENGINEERING BOREHOLE LOGS AND EXPLANATORY NOTES

Explanatory Notes - Engineering Logs

Engineering logs have been prepared in accordance with AS1726:2017 “Geotechnical Site Investigations” and as defined below.

DRILLING/EXCAVATION METHODS

Symbol	Term
AS	Auger Screwing
EX	Excavation
HA	Hand Auger
NMLC/HMLC	Diamond Core –triple tube
NQ/HQ/PQ	Diamond Core – wireline
PC	Percussion
PCB	Poly Carbonised Diamond Bit
PT	Push Tube
RAB	Rotary Air Blast
RC	Reverse Circulation
S	Sonic drill
VB	Vibrocoring
WB	Washbore with blade
WR	Washbore with roller (tricone)

SUPPORT

C Casing
M Drill mud
Nil No support

WATER

Partial water loss Water inflow

Complete water loss

Water level at date shown

NFGWO No Free Groundwater Observed
The observation of groundwater, whether present or not, was not possible due to drilling water, surface seepage or cave in of the borehole/test pit.

NFGWE No Free Groundwater Encountered
The borehole/test pit was dry soon after excavation. Inflow may have been observed had the borehole/test pit been left open for a longer period.

FIELD TEST (Soil borehole and test pit logs)

DM Dilatometer test
HB Hammer bounce
OT Other test (eg. plate load test)
PE Permeability test
PM Pressuremeter test
PP Pocket penetrometer
SPT Standard penetration test
SV Shear vane test

SAMPLE (Soil borehole and test pit logs)

B Bulk disturbed sample
D Disturbed sample
PT Push tube
SPT SPT sample
U50 Undisturbed sample in 50mm diameter tube
U75 Undisturbed sample in 75mm diameter tube

GRAPHIC LOG – see later

TOTAL CORE RECOVERY (Rock logs only)

$$TCR\ (\%) = \frac{\text{Length of core recovered}}{\text{Length of core run}} \times 100$$

ROCK QUALITY DESIGNATION (Rock logs only)

$$RQD\ (\%) = \frac{\sum \text{Length of sound core pieces} > 100\text{mm}}{\text{Length of core run}} \times 100$$

GROUP SYMBOL (Soil borehole and test pit logs)

Soils are classified to reflect their primary and significant secondary component/characteristic using the classification symbols described in AS1726-2017, summarised as follows.

Symbol	Major division	Typical names
GW, GP	GRAVEL	Gravel & gravel-sand mixtures, little/no fines
GM		Gravel-silt & gravel-sand-silt mixtures
GC		Gravel-clay & gravel-sand-clay mixtures
SW, SP	SAND	Sand & gravel-sand mixtures, little/no
SM		Sand-silt mixtures
SC		Sand-clay mixtures
ML	SILT & CLAY (low & medium plasticity)	Inorganic silt/clayey fine sand or silt
CL, CI		Inorganic clay, gravelly clay, sandy clay
OL		Organic silt
MH	SILT & CLAY (high plasticity)	Inorganic silt
CH		Inorganic clay, high plasticity
OH		Organic clay, med-high plasticity, organic silt
Pt	Highly organic soil	Peat, highly organic soil

FIELD DESCRIPTION

Soil and rock materials described to AS1726-2017. The description of percentage of cobbles and boulders in a soil may be limited by sample size.

MOISTURE CONDITION

Coarse grained soils and rocks
Dry (D), Moist (M) or Wet (W).
Estimated based on appearance and feel.

Cohesive soils

MC<PL	Moist, dry of plastic limit
MC≈PL	Moist, near plastic limit
MC>PL	Moist, wet of plastic limit
MC≈LL	Wet, near liquid limit
MC>LL	Wet, wet of liquid limit

Estimated based on judgement

COHESIVE SOILS - CONSISTENCY

The consistency of a cohesive soil is assessed by tactile means or field measurement of undrained shear strength.

A Hand Penetrometer may be used in the field or the laboratory to provide approximate assessment of unconfined compressive strength of cohesive soils (kPa) as follows:

Strength	Symbol	Indicative undrained shear strength (kPa)	Hand Penetrometer Reading (kPa)
Very Soft	VS	≤ 12	< 25
Soft	S	>12 and ≤ 25	25 to 50
Firm	F	> 25 and ≤ 50	50 to 100
Stiff	St	>50 and ≤ 100	100 to 200
Very Stiff	VSt	> 100 and ≤ 200	200 to 400
Hard	H	>200	> 400
Friable	Fr	-	-

COHESIONLESS SOILS - RELATIVE DENSITY

Relative density terms are used to describe silty and sandy material, and these are usually based on resistance to drilling penetration or the Standard Penetration Test (SPT) ‘N’ values.

The Standard Penetration Test (SPT) is carried out in accordance with AS 1289, 6.3.1. For completed tests the number of blows required to drive the split spoon sampler 300 mm is recorded as the N value. For incomplete tests the number of blows and the penetration beyond the seating depth of 150 mm are recorded. If the 150 mm seating penetration is not achieved the number of blows to achieve the measured penetration is recorded. SPT correlations may be subject to corrections for overburden pressure and equipment type.

Term	Symbol	Density Index	N Value (blows /0.3 m)	DCP (blows /100mm
Very Loose	VL	0 to 15	0 to 4	0 to 1
Loose	L	15 to 35	4 to 10	1 to 2
Medium Dense	MD	35 to 65	10 to 30	2 to 5
Dense	D	65 to 85	30 to 50	5 to 10
Very Dense	VD	>85	>50	>10

SOIL STRUCTURE

Soil structure is described to AS 1726-2017 if visible and present.

SOIL / ROCK ORIGIN

The geological origin of the soil or rock is presented as an interpretation of the geological and geomorphological setting. Origin cannot be deduced on the basis of material appearance and properties alone and is therefore limited by the availability of supporting geological information

ROCK MATERIAL WEATHERING

Rock weathering is described mainly using the following abbreviations and definitions used in AS1726.

Term	Symbol	Definition
Residual soil	RS	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible.
Extremely weathered	XW	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible.
Highly weathered	HW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognizable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Moderately weathered	MW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognizable, but shows little or no change of strength from fresh rock.
Slightly weathered	SW	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
Fresh	FR	Rock shows no sign of decomposition of individual minerals or colour changes.

If differentiation between highly and moderately weathered rock is not practicable, then Distinctly Weathered (DW) is used as defined in AS1726:2017.

INFERRED ROCK STRENGTH

Rock strength is inferred based on field assessment, Point Load Index or Uniaxial Compressive Strength as follows:

Term	Symbol	UCS (MPa)	Point Load Index $Is_{(50)}$ (MPa)
Very Low	VL	0.6 to 2	0.03 to 0.1
Low	L	2 to 6	0.1 to 0.3
Medium	M	6 to 20	0.3 to 1
High	H	20 to 60	1 to 3
Very High	VH	60 to 200	3 to 10
Extremely High	EH	>200	>10

● Diametral Point Load Index test
■ Axial Point Load Index test
◆ Uniaxial Compressive Strength test

strength test data is indicated on a dual PL/UCS column due to space constraints only. No correlation between the two values is to be inferred

DEFECT SPACING/BEDDING SPACING (Rock)

Measured at right angles to defects of same set or bedding.

Term	Defect Spacing	Bedding
Extremely closely spaced	<6 mm 6 to 20 mm	Thinly Laminated Laminated
Very closely spaced	20 to 60 mm	Very Thin
Closely spaced	0.06 to 0.2 m	Thin
Moderately widely spaced	0.2 to 0.6 m	Medium
Widely spaced	0.6 to 2 m	Thick
Very widely spaced	>2 m	Very Thick

DEFECT DESCRIPTION (Rock)

Symbol	Term	Symbol	Term
Bg	Bedding	DB	Drill Break
Pt	Parting	Se	Seam
Cn	Contact	SZ	Sheared Zone
Bd	Boundary	CZ	Crushed Zone
Jt	Joint	F	Fault
Fo	Foliation	Vn	Vein
C	Cleavage		

DEFECT ORIENTATION (Rock)

Dip measured relative to the horizontal plane in vertical boreholes and relative to core axis in inclined boreholes.

DEFECT ROUGHNESS AND SHAPE (Rock)

Roughness	Description	Roughness	Description
Sm	Smooth	Po	Polished
Ro	Rough	Sl	Slickensided
VRo	Very Rough		
Shape	**Description**	**Shape**	**Description**
Pl	Planar	Cu	Curved
Un	Undulating	Vu	Vuggy
Ir	Irregular	St	Stepped

COATING OR INFILLING (Rock)

Abbreviation	Description	Abbreviation	Description
Cln	Clean	Co	Coal
Cg	Coating	Cr	Crushed rock
In	infill	Fe	Limonite/ironstone
Sn	Stain	Fl	Feldspar
Vr	Veneer	Gp	Gypsum
Ca	Calcite	Mn	Manganese
Ch	Chlorite	Py	Pyrite
Cl	Clay	Qz	Quartz

Graphic Symbols — Soils and Rocks

Typical symbols for soils and rocks are as follows. Combinations of these symbols may be used to indicate mixed materials such as clayey sand.

SOIL SYMBOLS

Main components


CLAY


SILT


SAND


GRAVEL


BOULDERS / COBBLES


TOPSOIL


PEAT

Minor components


CLAYEY


SILTY


SANDY


GRAVELLY

OTHER MATERIAL SYMBOLS


FILL


BITUMEN


CONCRETE

ROCK SYMBOLS

Sedimentary Rocks


SANDSTONE


SILTSTONE


CLAYSTONE, MUDSTONE


SHALE


COAL


LIMESTONE


CONGLOMERATE

Igneous rocks


GRANITE


BASALT


UNDIFERENTIATED IGNEOUS

Metamorphic rocks


SLATE, PHYLLITE, SCHIST

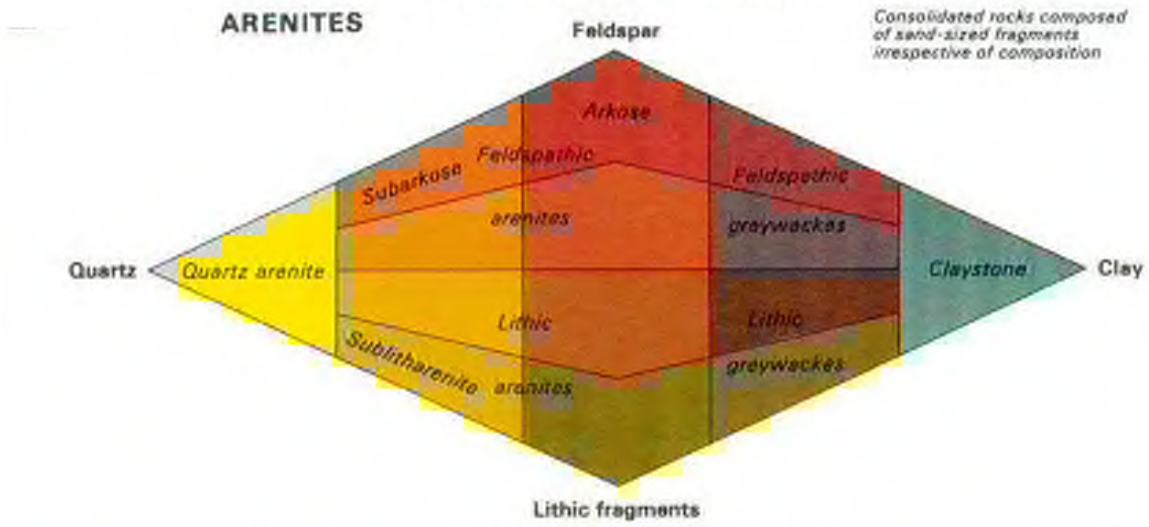

GNEISS


QUARTZITE

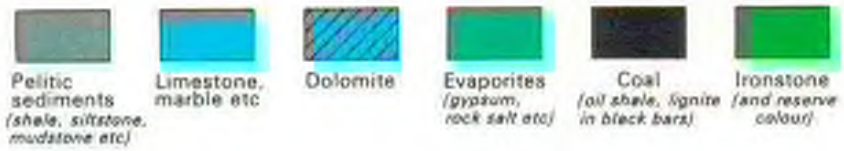
Colour Scheme — Soils and Rocks

The soil and rock colour schemes presented on the logs and fences have been derived from those below. The rock colour scheme is taken from Geoscience Australia's predecessor, the Bureau of Mineral Resources (BMR).

SEDIMENTARY ROCKS

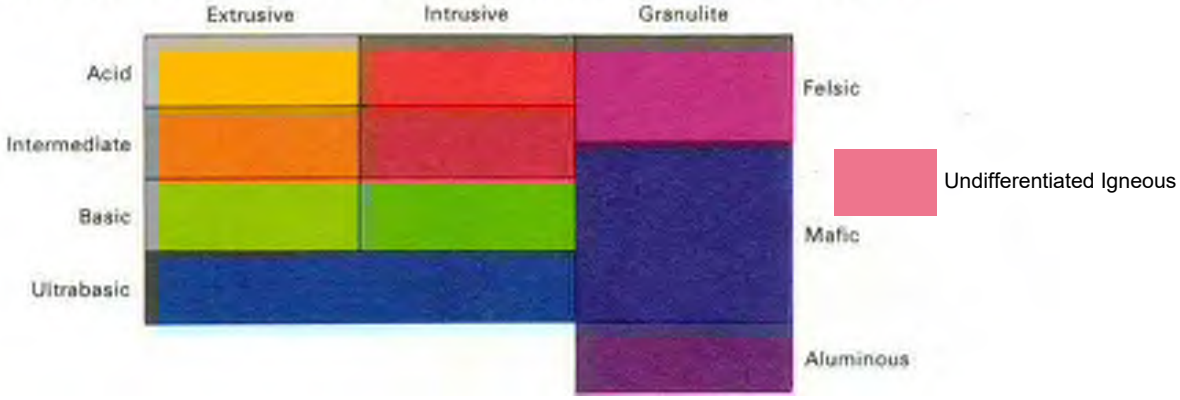


OTHER SEDIMENTARY ROCKS

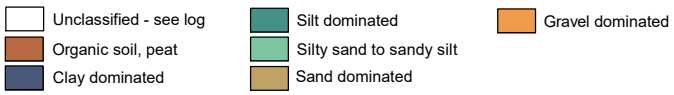


METAMORPHIC ROCKS

IGNEOUS AND HIGH GRADE METAMORPHIC ROCKS



SOIL COLOUR SCHEME



BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH01

SHEET : 1 OF 2

Client:	**EMKC**	Date Commenced:	**26/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**26/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**28 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 293053 N 6263930 MGA94 56**

Borehole Information							Field Material Description						
METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V	Nil	(NIL)	27.5	0.5					FILL: Sandy GRAVEL; dark grey, fine to coarse grained, sub-angular gravel, fine to medium grained sand, no odour	M			FILL
			27.5	0.5					FILL: Gravelly Silty CLAY; high plasticity, pale grey to brown, mottled red, fine to coarse grained, angular to sub-angular gravel, trace brick fragments, no odour	MC=PL to MC>PL			
			27.0	1.0	SPT 4, 7, 9 N=16	CBR SPT		CH	Silty CLAY; high plasticity, pale grey, heavily mottled red/orange, trace fine to coarse grained ironstone gravel	MC>PL		=250 =270 >600	RESIDUAL SOIL
			26.5	1.5									
			26.0	2.0									
			25.5	2.5	SPT 6, 9, 11 N=20	SPT		CL-CI	Silty CLAY; low to medium plasticity, pale grey, heavily mottled red/orange, trace fine to coarse grained ironstone gravel			=350 =450 =370	
			25.0	3.0				CI	Silty CLAY; medium plasticity, pale grey, heavily mottled red/orange, trace fine to coarse grained ironstone gravel			=300	
			24.5	3.5									
			24.0	4.0	SPT 9, 13, 15 N=28	SPT			4.1-4.3m: with ironstone bands, inferred very low strength			=390 =450	
			23.5	4.5					4.30-5.00m: trace fine grained sand			=350 =470	

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH01

SHEET : 2 OF 2

Client:	**EMKC**	Date Commenced:	**26/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**26/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**28 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 293053 N 6263930 MGA94 56**

Borehole Information							Field Material Description					
METHOD	SUPPORT	WATER	RL (m AHD) / DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V	Nil	(NIL) 26/02/21	5.00				CH	Gravelly Silty CLAY; high plasticity, pale grey to brown/red, medium to coarse grained, sub-angular to sub-rounded ironstone gravel	MC>PL		>600 >600 >600	RESIDUAL SOIL
			22.5 5.5	SPT 7, 30/145mm HB N=R	SPT							
			22.0 6.0 / 6.0					SHALE; grey to dark grey/brown, extremely weathered, inferred very low strength Recovered as Silty CLAY; high plasticity with fine to medium grained ironstone gravel	M to W			WEATHERED ROCK
			21.5 6.5									
			21.0					END OF BOREHOLE AT 6.90 m Refusal				
			20.5									
			20.0									
			19.5									
			19.0									
			18.5									

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH02

SHEET : 1 OF 3

Client:	**EMKC**	Date Commenced:	**25/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**25/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**25 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 292999 N 6263901 MGA94 56**

Borehole Information							Field Material Description						
METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V	Nil	(NIL)	24.5	0.5					FILL: Gravelly CLAY; grey to dark brown, high plasticity, fine to coarse grained, sub-angular to sub-rounded gravel, trace brick/tile fragments, no odour	MC=PL to MC>PL			FILL
			0.80					CH	Silty CLAY; high plasticity, pale grey, mottled red/orange, no odour	MC>PL		=270	RESIDUAL SOIL
			24.0	1.0	SPT 4, 20, 30 N=50								
			1.20					CI	Sandy CLAY; medium plasticity, pale grey, heavily mottled red/orange, fine grained sand, with fine to coarse grained, sub-angular to sub-rounded ironstone gravel			=210 >600 >600	
			23.5	1.5									
			23.0	2.0				CI-CH	Sandy Silty CLAY; medium to high plasticity, pale grey, mottled orange, fine grained sand				
			22.5	2.5	SPT 4, 6, 7 N=13	SPT		CI-CH	Silty CLAY; medium to high plasticity, pale grey, mottled orange, trace fine grained sand			=200 =210 =250	
			2.95									=270	
			22.0	3.0				CI-CH	Sandy Silty CLAY; medium to high plasticity, pale grey, mottled orange, fine grained sand				
			21.5	3.5									
			21.0	4.0	SPT 4, 8, 13 N=21	SPT			4.2-4.5m: trace fine to medium grained ironstone gravel			=190 =220 =270 =250	
			20.5	4.5									

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH02

Client:	**EMKC**	Date Commenced:	**25/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**25/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**25 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 292999 N 6263901 MGA94 56**

Borehole Information						Field Material Description						
METHOD	SUPPORT	WATER	RL (m AHD) / DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V	Nil		5.00				CH	Silty CLAY; high plasticity, pale grey	MC>PL			RESIDUAL SOIL
			19.5 5.5	SPT 22, 30/75mm HB N=R	SPT							
			5.60					SHALE; brown to dark brown, dark grey, extremely weathered, inferred very low strength Recovered as Silty CLAY; high plasticity	M to W		>600 >600 >600	WEATHERED ROCK
			19.0 6.0									
			18.5 6.5									
			18.0 7.0	SPT 27, 30/75mm HB N=R	SPT						>600	
								REFER TO CORED BOREHOLE LOG				
			17.5 7.5									
			17.0 8.0									
			16.5 8.5									
			16.0 9.0									
			15.5 9.5									

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

CORED BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH02

SHEET : 3 OF 3

Client:	**EMKC**	Date Commenced:	**25/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**25/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**25 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 292999 N 6263901 MGA94 56**

Borehole Information							Field Material Description					
METHOD	SUPPORT	WATER	TOTAL CORE RECOVERY (TCR)	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	SOIL/ROCK MATERIAL FIELD DESCRIPTION	WEATHERING	INFERRED STRENGTH AND STRENGTH TEST MPa ($Is_{(50)}$/UCS) VL 0.1/2, L 0.3/6, M 1/20, H 3/60, VH 10/200, EH	AVERAGE DEFECT SPACING (mm) <20, 20-60, 60-200, 200-600, 600-2000, >2000	STRUCTURE AND ADDITIONAL OBSERVATIONS
					19.5	5.5						
					19.0	6.0						
					18.5	6.5						
					18.0	7.0						
								START CORING AT 7.20m				
HQ	C	100% Water RETURN	100	93		7.20		SHALE: pale grey to dark grey, orange staining, thinly to medium bedded, at 0-5°, with fine grained SANDSTONE (10%)	XW			
					17.5	7.5			HW			7.62m: DB
					17.0	8.0						7.9m: Bg x6 (7.90-8.25m), 0°, Pl, Ro, Sn Fe
						8.20		LAMINITE: SANDSTONE (70%): fine grained, pale grey SILTSTONE (30%): grey to dark grey, thinly laminated to thinly bedded, at 0-5°	MW to SW			
					16.5	8.5						8.35m: Bg x5 (8.35-9.10m), 0°, Pl, Ro, Sn Fe
					16.0	9.0						9.12m: DB
								9.2-10.0m: Siltstone (70%), Sandstone (30%)	SW			9.4m: Bg, 0°, Pl, Ro, Cln
					15.5	9.5						9.65m: Bg, 0°, Pl, Ro, Cln
								END OF BOREHOLE AT 10.00 m Target depth				

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

PointID : BH02 Depth Range: 7.20 - 10.00 m

Telephone:
Facsimile:
Email:

TITLE: EMKC 2/65 Dunheved Circuit, St Marys NSW 2170 St Marys Geotechnical Site Investigation Core Photo - BH02	DRAWN	DATE 30/03/2021	
	CHECKED	DATE 30/03/2021	
	SCALE Not To Scale		A4
	PROJECT No PS123745	FIGURE No 1/1	

BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH03

SHEET : 1 OF 2

Client:	**EMKC**	Date Commenced:	**25/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**25/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**26 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 293008 N 6263860 MGA94 56**

Borehole Information							Field Material Description						
METHOD	SUPPORT	WATER	RL (m AHD) / DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V	Nil	(NIL)	0.20					FILL: Clayey GRAVEL; dark brown, fine to coarse grained, sub-angular to sub-rounded gravel, medium plasticity clay, no odour	M			FILL
			25.5 0.5					FILL: Gravelly Silty CLAY; high plasticity, brown to dark brown/grey, fine to coarse grained, sub-angular gravel, trace brick/tile fragments, no odour	MC>PL			
			0.90									
			25.0 1.0				CH	Silty CLAY; high plasticity, pale grey, mottled red	MC>PL		=250 =300	RESIDUAL SOIL
			1.20	SPT 2, 6, 16 N=22	SPT		CI	Sandy Silty CLAY; medium plasticity, pale grey mottled pale orange, fine grained sand			>600 =450 =330	
			24.5 1.5									
			24.0 2.0		CBR							
			2.20				CI	Silty CLAY; medium plasticity, pale grey, mottled red-orange, with fine grained sand, trace fine grained ironstone gravel 2.30-2.35m: with Ironstone bands, red, inferred very low strength				
			23.5 2.5	SPT 5, 9, 11 N=20	SPT						=330 =350 =400 =370	
			23.0 3.0/3.0				CI-CH	Silty CLAY; medium to high plasticity, pale grey, mottled red-orange, with fine grained sand, trace fine grained ironstone gravel				
			22.5 3.5									
			22.0 4.0	SPT 5, 8, 10 N=18	SPT						=360 =370 =400 =270 =350	
			21.5 4.5									

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH03

SHEET : 2 OF 2

Client:	**EMKC**	Date Commenced:	**25/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**25/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**26 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 293008 N 6263860 MGA94 56**

Borehole Information							Field Material Description					
METHOD	SUPPORT	WATER	RL (m AHD) / DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V	Nil	25/02/21	5.00					SHALE; grey to brown, extremely weathered, inferred very low strength Recovered as Silty CLAY; medium to high plasticity	M to W			WEATHERED ROCK
			20.5 5.5	SPT 6, 15, 26 N=41	SPT						>600 >600 >600	
			20.0 6.0									
			19.5 6.5									
			19.0 7.0					END OF BOREHOLE AT 7.00 m Target depth				
			18.5									
			18.0									
			17.5									
			17.0									
			16.5									

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH04

SHEET : 1 OF 2

Client:	**EMKC**	Date Commenced:	**24/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**24/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**27 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 293086 N 6263894 MGA94 56**

Borehole Information							Field Material Description						
METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V	Nil	(NIL)	26.80	0.20					TOPSOIL: Clayey SILT; low plasticity, brown, trace roots, no odour	M			TOPSOIL
			26.5	0.5				CH	Silty CLAY; high plasticity, pale grey, heavily mottled red, trace fine grained ironstone gravel, no odour	MC>PL			RESIDUAL SOIL
			26.0	1.0	SPT 5, 8, 9 N=17	SPT						=350 =370 >600	
			25.5	1.5									
			25.0	2.0	SPT 3, 6, 8 N=14	SPT			2.0m: becoming pale grey, mottled orange 2.2-2.3m: trace roots/organic material, dark grey			=250 =280 =270 =220	
			24.5	2.5									
			24.0	3.0	SPT 4, 5, 9 N=14	SPT			3.3-3.5m: trace roots/organic material, dark grey			=280 =350 =300 =290	
			23.5	3.5									
			23.0	4.0	SPT 9, 13, 14 N=27	SPT			4.1-4.8m: becoming pale grey, heavily mottled red/orange, with fine grained ironstone gravel			=270 =360 =500 =370	
			22.5	4.5									
			22.00	4.80				CH	Gravelly CLAY; high plasticity, pale grey to dark red, mottled orange, fine grained, sub-angular ironstone gravel.				

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH04

SHEET : 2 OF 2

Client:	**EMKC**	Date Commenced:	**24/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**24/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**27 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 293086 N 6263894 MGA94 56**

Borehole Information							Field Material Description						
METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V	Nil	24/02/21	21.5	5.5	SPT 30/145mm HB N=R	SPT		CH	Gravelly CLAY; high plasticity, pale grey to dark red, mottled orange, fine grained, sub-angular ironstone gravel.	MC>PL		=300 >600 =280 =320	RESIDUAL SOIL
				5.80									
			21.0	6.0	SPT 30/145mm HB N=R	SPT			SHALE; pale grey, extremely weathered, inferred very low strength Recovered as Silty CLAY; high plasticity	M to W		>600 >600 >600	WEATHERED ROCK
			20.5	6.5									
			20.0	7.0					END OF BOREHOLE AT 7.00 m Target depth				
			19.5										
			19.0										
			18.5										
			18.0										
			17.5										

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH05

SHEET : 1 OF 3

Client:	**EMKC**	Date Commenced:	**24/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**24/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**26 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 293107 N 6263816 MGA94 56**

Borehole Information							Field Material Description						
METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V	Nil	(NIL)	25.5	0.5					TOPSOIL: Clayey SILT; low plasticity, pale brown, trace roots, no odour	M			TOPSOIL
				0.20				CL	Silty CLAY; low plasticity, pale grey, heavily mottled red, with fine grained, sub-angular ironstone gravel, with fine grained sand, no odour	MC>PL			RESIDUAL SOIL
			25.0	1.0	SPT 8, 8, 11 N=19	SPT						>600 >600 >600	
			24.5	1.5									
			24.0	2.0	SPT 7, 11, 15 N=26	SPT						>600 >600 >600	
			23.5	2.5									
				2.80				CL-CI	Sandy CLAY; low to medium plasticity, pale grey, mottled red/orange, fine grained sand, trace ironstone gravel, trace dark grey organic material/roots				
			23.0	3.0	SPT 7, 7, 6 N=13	SPT						=170 =200 =150 =180	
			22.5	3.5									
			22.0	4.0	SPT 4, 6, 7 N=13	SPT						=170 =320 =250 =200 =190	
			21.5	4.5									

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH05

Client:	**EMKC**	Date Commenced:	**24/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**24/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**26 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 293107 N 6263816 MGA94 56**

Borehole Information							Field Material Description						
METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V	Nil	(NIL)	5.30		SPT 13, 11, 18 N=29	SPT		CL-CI	Sandy CLAY; low to medium plasticity, pale grey, mottled red/orange, fine grained sand, trace ironstone gravel, trace dark grey organic material/roots	MC>PL		>600 >600	RESIDUAL SOIL
			20.5	5.5					SHALE; grey to dark grey, brown, extremely weathered, inferred very low strength Recovered as Silty CLAY; medium to high plasticity, interbedded with ironstone gravel	M		>600	WEATHERED ROCK
			20.0	6.0	SPT 6, 10, 19 N=29	SPT						>600 >600 >600	
			19.5	6.5									
			19.0	7.0	SPT 17, 20/80mm HB N=R	SPT						>600	
			18.5	7.5									
			18.0	8.0					REFER TO CORED BOREHOLE LOG				
			17.5	8.5									
			17.0	9.0									
			16.5	9.5									

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

CORED BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH05

SHEET : 3 OF 3

Client:	**EMKC**	Date Commenced:	**24/2/21**
Project:	**St Marys Geotechnical Site Investigation**	Date Completed:	**24/2/21**
Borehole Location:	**2/65 Dunheved Circuit, St Marys NSW 2170**	Recorded By:	**HW**
Project Number:	**PS123745**	Log Checked By:	**CW**

Drill Model/Mounting:	**DB8/ Track**	Hole Angle:	**-90°**	Surface RL:	**26 m AHD**
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 293107 N 6263816 MGA94 56**

Borehole Information							Field Material Description					
METHOD	SUPPORT	WATER	TOTAL CORE RECOVERY (TCR)	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	SOIL/ROCK MATERIAL FIELD DESCRIPTION	WEATHERING	INFERRED STRENGTH AND STRENGTH TEST MPa ($Is_{(50)}$/UCS) VL 0.1 / 2, L 0.3 / 6, M 1 / 20, H 3 / 60, VH 10 / 200, EH	AVERAGE DEFECT SPACING (mm) <20, 20-60, 60-200, 200-600, 600-2000, >2000	STRUCTURE AND ADDITIONAL OBSERVATIONS
					20.5	5.5						
					20.0	6.0						
					19.5	6.5						
					19.0	7.0						
					18.5	7.5						
					18.0	8.00 8.0		START CORING AT 8.00m				
HQ	C	100% Water RETURN	100	80				SHALE: grey to dark grey, red, with fine to medium grained ironstone, in a Silty CLAY matrix	XW			
						8.40						
					17.5	8.5		SILTSTONE: brown to pale grey, thinly bedded at 0°	HW to MW			8.63m: DB 8.64m: Bg, 0°, Pl, Ro, Cln 8.75m: DB
						8.90						
					17.0	9.0		LAMINITE: SANDSTONE (60%): fine grained, pale grey to brown, orange staining SILTSTONE (40%): grey to dark grey, thinly laminated to very thinly bedded, at 0-5°				8.9m: DB 8.95m: DB 9.01m: DB 9.06m: DB 9.1m: Jt, 90°, Pl, Ro, Sn Fe 9.12m: DB
						9.30						
					16.5	9.5		SILTSTONE: grey to dark grey, medium bedded at 0-5°, interbedded with fine grained SANDSTONE (10%)	SW to FR			9.5m: Bg, 0°, Pl, Ro, Cln 9.62m: DB 9.77m: DB 9.8m: Bg, 0°, Pl, Ro, Cln 9.9m: DB
								END OF BOREHOLE AT 10.00 m Target depth				

This borehole log should be read in conjunction with WSP's accompanying explanatory notes.

PointID : BH05 Depth Range: 8.00 - 10.00 m

Telephone:
Facsimile:
Email:

TITLE: EMKC 2/65 Dunheved Circuit, St Marys NSW 2170 St Marys Geotechnical Site Investigation Core Photo - BH05	DRAWN	DATE 30/03/2021	
	CHECKED	DATE 30/03/2021	
	SCALE Not To Scale		A4
	PROJECT No PS123745	FIGURE No 1/1	

ATTACHMENT C

LABORATORY TEST CERTIFICATES

resource laboratories
AGGREGATE, ROCK, AND SOIL TESTING
ABN: 25 131 532 020
Sydney: 12/1 Boden Road Seven Hills NSW 2147 | PO Box 45 Pendle Hill NSW 2145
Ph: (02) 9674 7711 **| Fax:** (02) 9674 7755 **| Email:** info@resourcelab.com.au

Test Report

Customer: WSP Australia Pty Limited
Project: PS123745
Location: 89 Dunheved Circuit, St Marys

Job number: 21-0050
Report number: 1
Page: 1 of 1

Moisture Content

Sampling method: Tested as received
Test method(s): AS 1289.1.1, 2.1.1

	Results				
Laboratory sample no.	23967	23973	23976		
Customer sample no.	BH02 1.00-1.45m	BH04 3.00-3.45m	BH05 4.00-4.45m		
Date sampled	25/02/2021	24/02/2021	24/02/2021		
Material description	silty CLAY, with sand, trace of gravel, grey/red/ yellow-brown	silty CLAY, grey/red/ yellow-brown	silty CLAY, trace of sand and gravel, grey/red/ yellow-brown		
Moisture content (%)	15.7	15.4	15.3		

Laboratory sample no.					
Customer sample no.					
Date sampled					
Material description					
Moisture content (%)					

Approved Signatory: C. Greely **Date:** 29/03/2021

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Accredited for compliance with ISO/IEC 17025 - Testing.

NATA Accredited Laboratory Number: **17062**

resource laboratories
AGGREGATE, ROCK, AND SOIL TESTING
ABN: 25 131 532 020
Sydney: 12/1 Boden Road Seven Hills NSW 2147 | PO Box 45 Pendle Hill NSW 2145
Ph: (02) 9674 7711 **| Fax:** (02) 9674 7755 **| Email:** info@resourcelab.com.au

Test Report

Customer: WSP Australia Pty Limited
Project: PS123745
Location: 89 Dunheved Circuit, St Marys

Job number: 21-0050
Report number: 2
Page: 1 of 1

Particle Size Distribution

Sampling method: Tested as received
Test method(s): AS 1289.1.1, 3.6.1

	Results				
Laboratory sample no.	23968				
Customer sample no.	BH02 2.50-2.95m				
Date sampled	25/02/2021				
Material description	sandy silty CLAY, grey/yellow-brown				
% Passing AS Sieve					
63.0mm					
53.0mm					
37.5mm					
26.5mm					
19.0mm					
13.2mm					
9.5mm					
6.7mm					
4.75mm					
2.36mm					
1.18mm					
600µm	100				
425µm	99				
300µm	98				
150µm	83				
75µm	61				

Approved Signatory: C. Greely **Date:** 29/03/2021

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Ph: (02) 9674 7711 **| Fax:** (02) 9674 7755 **| Email:** info@resourcelab.com.au

Test Report

Customer: WSP Australia Pty Limited
Project: PS123745
Location: 89 Dunheved Circuit, St Marys

Job number: 21-0050
Report number: 3
Page: 1 of 1

Soil Index Properties

Sampling method: Tested as received

Test method(s): AS 1289.1.1, 2.1.1, 3.1.2, 3.2.1, 3.3.1 .3.4.1

	Results				
Laboratory sample no.	23965	23970	23975		
Customer sample no.	BH01 2.50-2.95m	BH03 2.50-2.95m	BH05 2.00-2.45m		
Date sampled	25/02/2021	25/02/2021	24/02/2021		
Material description	silty CLAY, trace of gravel, grey/red/yellow-brown	silty CLAY, trace of sand and gravel, pale grey/red/yellow-brown	silty CLAY, trace of sand and gravel, red/grey/ yellow-brown		
Liquid limit (%)	37	36	34		
Plastic limit (%)	12	12	12		
Plasticity index (%)	25	24	22		
Linear shrinkage (%)	14.0	14.5	10.0		
Cracking / Curling / Crumbling	Curling	Curling	-		
Sample history	Air dried	Air dried	Air dried		
Preparation	Dry sieved	Dry sieved	Dry sieved		

Approved Signatory: C. Greely **Date:** 29/03/2021

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NATA Accredited Laboratory Number: **17062**

resource laboratories
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Ph: (02) 9674 7711 | **Fax:** (02) 9674 7755 | **Email:** info@resourcelab.com.au

Test Report

Customer: WSP Australia Pty Limited
Job number: 21-0050
Project: PS123745
Report number: 4
Location: 89 Dunheved Circuit, St Marys
Page: 1 of 1

Soil Index Properties

Sampling method: Tested as received
Test method(s): AS 1289.1.1, 3.1.2, 3.4.1

	Results				
Laboratory sample no.	23966	23969	23977		
Customer sample no.	BH01 5.50-5.95m	BH02 4.00-4.45m	BH05 5.00-5.45m		
Date sampled	25/02/2021	25/02/2021	24/02/2021		
Material description	silty CLAY, trace of gravel, yellow-brown/ pale grey	silty CLAY, trace of gravel, pale grey/red/ yellow-brown	silty CLAY, trace of gravel, red/grey/ yellow-brown		
Liquid limit (%)	-	-	-		
Plastic limit (%)	-	-	-		
Plasticity index (%)	-	-	-		
Linear shrinkage (%)	11.0	13.5	14.5		
Cracking / Curling / Crumbling	-	Curling	-		
Sample history	Air dried	Air dried	Air dried		
Preparation	Dry sieved	Dry sieved	Dry sieved		

Approved Signatory: C. Greely **Date:** 29/03/2021

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Accredited for compliance with ISO/IEC 17025 - Testing.
NATA Accredited Laboratory Number: **17062**

CERTIFICATE OF ANALYSIS

Work Order	: **ES2109224**	Page	: 1 of 2
Client	: **RESOURCE LABORATORIES**	Laboratory	: Environmental Division Sydney
Contact	: MR CHRIS GREELY	Contact	: Angus Harding
Address	: RESOURCE LABORATORIES PTY LTD P.O.BOX 45 PENDLE HILL NSW 2145	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: 02 9674 7711	Telephone	: +61 2 8784 8555
Project	: 21-0050 PS123745 - 89 Dunheved Circuit, St Marys	Date Samples Received	: 16-Mar-2021 13:40
Order number	: 21-0111	Date Analysis Commenced	: 16-Mar-2021
C-O-C number	: ----	Issue Date	: 19-Mar-2021 14:26
Sampler	: ----		
Site	: St Marys		
Quote number	: EN/222		
No. of samples received	: 3		
No. of samples analysed	: 3		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

resource laboratories
AGGREGATE, ROCK, AND SOIL TESTING
ABN: 25 131 532 020
Sydney: 12/1 Boden Road Seven Hills NSW 2147 | PO Box 45 Pendle Hill NSW 2145
Ph: (02) 9674 7711 | **Fax:** (02) 9674 7755 | **Email:** info@resourcelab.com.au

Test Report

Customer: WSP Australia Pty Limited
Job number: 21-0050
Project: PS123745
Report number: 5
Location: 89 Dunheved Circuit, St Marys
Page: 1 of 1

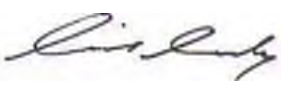
California Bearing Ratio

Sampling method: Tested as received
Test method(s): AS 1289.1.1, 2.1.1, 5.1.1, 6.1.1

	Results			
Laboratory sample no.	23963	23964		
Customer sample no.	BH01 1.00-1.20m	BH03 2.00-2.20m		
Date sampled	25/02/2021	25/02/2021		
Material description	silty CLAY, with sand and gravel, brown/grey/red	silty CLAY, trace of gravel, red		
Maximum dry density (t/m^3)	1.90	1.60		
Optimum moisture content (%)	12.8	22.8		
Field moisture content (%)	n/a	n/a		
Oversize retained on 19.0mm sieve (%)	10	4		
Minimum curing time (hours)	24	96		
Dry density before soak (t/m^3)	1.87	1.58		
Dry density after soak (t/m^3)	1.85	1.55		
Moisture content before soak (%)	12.7	22.3		
Moisture content after soak (%)	15.2	25.4		
Moisture content after test - top 30mm (%)	15.8	28.2		
Moisture content after test - remaining depth (%)	14.3	24.9		
Density ratio before soaking (%)	98.0	98.5		
Moisture ratio before soaking (%)	99.0	98.0		
Period of soaking (days)	4	4		
Compactive effort	Standard	Standard		
Mass of surcharge applied (kg)	4.5	4.5		
Swell after soaking (%)	1.0	1.5		
Penetration (mm)	5.0	2.5		
CBR Value (%)	**6**	**4.0**		

Notes: Specified LDR: 98 ±1%

Method of establishing plasticity level - Visual / tactile

Approved Signatory:  C. Greely **Date:** 30/03/2021

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NATA Accredited Laboratory Number: **17062**

Document Set ID: 9858356
Version: 1, Version Date: 17/12/2021

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

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

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

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

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

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

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

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	23971 BH03, 4.00-4.45m	23972 BH04, 1.00-1.45m	23974 BH05, 1.00-1.45m	----	----
			Sampling date / time	25-Feb-2021 00:00	24-Feb-2021 00:00	24-Feb-2021 00:00	----	----
Compound	CAS Number	LOR	Unit	ES2109224-001	ES2109224-002	ES2109224-003	--------	--------
				Result	Result	Result	----	----
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	5.3	4.9	4.7	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	12.3	11.8	11.9	----	----
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	40	120	70	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	10	mg/kg	1040	640	750	----	----

APPENDIX I

LAND INSIGHT REPORT AND HISTORICAL AERIALS

Land Insight

Due Diligence Insight Report

2/65 Dunheved Circuit,
St Marys NSW

17 March 2021

Understanding your report

Your Report has been produced by Land Insight and Resources (Land Insight).

Your Report is based on information available from public databases and sources at the date of reporting. The information gathered relates to land that is within a 200 to 2000m radius (buffer zone) from the boundaries of the Property. A smaller or larger radius may be applied for certain records (as listed under records and as shown in report maps).

While every effort is made to ensure the details in your Report are correct, Land Insight cannot guarantee the accuracy or completeness of the information or data provided.

The report provided by Land Insight includes data listed on page 4 (table of contents). All sources of data and definitions are provided in the Product Guide (Attached). For a full list of references, metadata, publications or additional information not provided in this report, please contact info@liresources.com.au

The report does not include title searches; dangerous good searches or; property certificates (unless requested); or information derived from a physical inspection, such as hazardous building materials, areas of infilling or dumping/spilling of potentially contaminated materials. It is important to note that these documents and an inspection can contain information relevant to contamination that may not be identified by this Report.

Due to the ongoing nature of database development and frequency of updates provided by various state government regulators the data displayed within this report is only current from date of production.

This Report, and your use of it, is regulated by Land Insight's Terms and Conditions (See Land Insight's Product Guide).

Executive Summary

Dataset	Identified	Not identified
Sensitive Receptors		✗
Planning Controls	✓	
Federal, State and Local Heritage		✗
Soil and Land Use Information	✓	
Salinity	!	
Radon	✓	
Acid Sulfate Soil	!	
Geology	✓	
Naturally Occurring Asbestos Potential		✗
Topography	✓	
Hydrogeology	✓	
Groundwater Bores	✓	
Groundwater Dependent Ecosystems	!	
Other Bores	!	
Environmental Registers, Licences and Incidents		
Contaminated Land Record of Notices	!	
Sites Notified as Contaminated to the NSW EPA	!	
Potentially Contaminated Areas		
Defence Sites (current, former and RCIP)	!	
Former Gasworks Sites		✗
PFAS Sites		✗
Licensing under the POEO Act		
Licences	!	
Surrendered Licences still Regulated by EPA	!	
Clean Up and Penalty Notices	!	
NPI Industrial Facilities		✗
Public Register of Properties Affected by Loose-Fill Asbestos Insulation		✗
Other Potentially Contaminating Activities		
Cattle Dip Sites		✗
Dry Cleaners		✗
Fire and Rescue Sites		✗
Gas Terminals		✗
Liquid Fuel Depots/Terminals		✗
Mines and Quarries		✗
Petrol Stations	!	
Power Stations		✗
Substation/Switching Station		✗
Telephone Exchanges		✗
Waste Management Facilities	!	
Wastewater Treatment Facilities		✗
Current Commercial & Trade Directory Data	!	
Tanks (AST/UST)		✗
Contamination Legacy Areas		✗
Derelict Mines and Quarries		✗
Historical Landfills		✗
Unexploded Ordnance (UXO) Sites - Department of Defence (DoD)		✗
Historic Commercial & Trade Directory Data	!	
Other Environmental Constraints		
Natural Hazards	!	
State Environmental Planning Policy (Coastal Management)		✗

INDEX

Section 1 - Property Setting

1.1 SITE LOCATION MAP AND SENSITIVE RECEPTORS

Map 1 (200m Buffer)

Sensitive receptor	Category	Distance (m)*	Direction
Not identified			

*Distance from the sensitive receptor point feature to the site boundary centroid.

1.2 PLANNING CONTROLS

Map 2 (onsite)

Zoning

Code	Classification
IN1	General Industrial

Environmental Planning Instruments

Type	Local Environmental Plan	Classification
Local Provisions	State Environmental Planning Policy (Western Sydney Aerotropolis) 2020	Wind Turbine Buffer Zone

1.3 SOIL AND LAND USE INFORMATION

Map 3a/3b (onsite)

Soil Landscape

Soil Landscape	ALbp	BERKSHIRE PARK	**Soil Group**	ALLUVIAL
Description	Landscape—dissected, gently undulating low rises on the Tertiary terraces of the Hawkesbury/Nepean River system. Soils—weakly pedal orange heavy clays and clayey sands, often mottled. Ironstone nodules common. Large (up to 20 cm) silcrete boulders occur in sand/clay matrix. Solods (Dy3.41), yellow podzolic soils (Dy4.11, Dy2.11, Dy2.21, Dy2.22), red podzolic soils (Dr4.11), chocolate soils (Dr4.11, Dr4.61), structured plastic clays (Uf6.11, Uf6.12), structured clays (Uf5.23, Gn4.11 and Gn3.11). Limitations—very high wind erosion hazard if cleared. Gully, sheet and rill erosion on dissected areas. Localised seasonal waterlogging, localised flood hazard, impermeable subsoils, low fertility.			
Soil Landscape	ALsc	SOUTH CREEK	**Soil Group**	ALLUVIAL
Description	Landscape—floodplains, valley flats and drainage depressions of the channels on the Cumberland Plain. Usually flat with incised channels; mainly cleared. Soils—often very deep layered sediments over bedrock or relict soils. Where pedogenesis has occurred structured plastic clays (Uf6.13) or structured loams (Um6.1) in and immediately adjacent to drainage lines; red and yellow podzolic soils (Dr5.11, Dy2.41, Dr2.21) are most common terraces with small areas of structured grey clays (Gn4.54), leached clay (Uf4.42) and yellow solodic soils (Dy4.42, Dy5.23). Limitations—flood hazard, seasonal waterlogging, localised permanently high watertables, localised water erosion hazard, localised surface movement potential.			

Salinity

Salinity Hazard	Very High	Western Sydney Hydrogeological Landscapes

Radon

Radon Level	Bq/m3	5

Typical radon levels in Australia are low and the values shown are the average values for each census district. For specific location, factors such as the local geology and house type could lead to different values. (ARPANSA).

Acid Sulfate Soil

ASS Risk Maps *(Table 1.3.1)*	**On the Property?**		**Within Buffer?**	
Class	Not identified		Not identified	
Atlas of Australian Acid Sulfate Soil *(Table 1.3.2)*	Cn(p4)	ASS in inland lakes, waterways, wetlands and riparian zones	**Probability of Occurrence**	Extremely low probability of occurrence

Table 1.3.1. Classification scheme in the ASS Planning Maps

Class of Land as shown on ASS Planning Maps	
1	Any works.
2a	Works below the natural ground surface. Works by which the watertable is likely to be lowered.
2b	Works other than ploughing below the natural ground surface. Works by which the watertable is likely to be lowered.
3	Works more than 1 metre below the natural ground surface. Works by which the watertable is likely to be lowered more than 1 metre below the natural ground surface.
4	Works more than 2 metres below the natural ground surface. Works by which the watertable is likely to be lowered more than 2 metres below the natural ground surface.
5	Works within 500 metres of adjacent Class 1, 2a, 2b, 3 or 4 land that is below 5 metres Australian Height Datum and by which the watertable is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2a, 2b, 3 or 4 land.

For each class of land, the maps identify the type of works likely to present an environmental risk if undertaken in the particular class of land. If these types of works are proposed, further investigation is required to determine if ASS are actually present and whether they are present in such concentrations as to pose a risk to the environment.

Table 1.3.2. Atlas of Australian Acid Sulfate Soils[1] (ASRIS) (CSIRO/NatCASS)

Code	**Distinguishing soil/sediment properties, vegetation, landforms, or other characteristics**
	Probability of Occurrence of ASS[1]
A	**High Probability of occurrence -** (>70% chance of occurrence in mapping unit)
B	**Low Probability of occurrence** - (6-70% chance of occurrence in mapping unit)
C	**Extremely low probability of occurrence** - (1-5% chance of occurrence in mapping unit)
D	**No probability of occurrence** - (<1% chance of occurrence in mapping unit)
x	**Disturbed ASS[1] terrain -** (ASS[1] material present below urban development).
u	**Unclassified** - (Insufficient information to classify map unit)
	Zones
a	Potential acid sulfate soil material and/or Monosulfidic Black Ooze (MBO).
b, c	Potential acid sulfate soil generally within upper 1 m.
c, d, e	ASS[1] generally within upper 1 m.
f	ASS[1] generally below 1 m from the surface
g	ASS[1], generally below 3 m from the surface.
h	ASS[1] generally within 1 m of the surface.

Code	Distinguishing soil/sediment properties, vegetation, landforms, or other characteristics
Probability of Occurrence of ASS[1]	
i, j	ASS[1] generally below 1 m of the surface.
k	ASS[1] material and/or Monosulfidic Black Ooze (MBO).
l, m, n, o, p, q	ASS[1] generally within upper 1 m in wet / riparian areas.
Subscripts to codes	
(a)	Actual acid sulfate soil (AASS) = sulfuric material.
(p)	Potential acid sulfate soil (PASS) = sulfidic material.
(q)	Monosulfidic Black Ooze (MBO) is organic ooze enriched by iron monosulfides.
Confidence levels	
(1)	All necessary analytical and morphological data are available
(2)	Analytical data are incomplete but are sufficient to classify the soil with a reasonable degree of confidence
(3)	No necessary analytical data are available, but confidence is fair, based on a knowledge of similar soils in similar environments
(4)	No necessary analytical data are available, and classifier has little knowledge or experience with ASS, hence classification is provisional

[1]Acid Sulfate Soils (ASS) are all those soils in which sulfuric acid may be produced, is being produced, or has been produced in amounts that have a lasting effect on main soil characteristics (Pons 1973). Acid sulfate soil (ASS) may include PASS or AASS + PASS. Potential acid sulfate soil (PASS) = sulfidic material. Actual acid sulfate soil (AASS) = sulfuric material.

1.4 GEOLOGY AND TOPOGRAPHY

Map 4 (onsite)

Geology

Map Sheet	Code	Formation	Group	Dominant Lithology	Description
Newcastle to Wollongong Coastal Quaternary Mapping	Q_af	Alluvial floodplain deposits	Alluvium	Clastic sediment	Silt, very fine- to medium-grained lithic to quartz-rich sand, clay.
Penrith 1:100,000 Geological Sheet	NM__d	Londonderry Clay	-	Clay	Clay, patches of ferruginised, consolidated sand.

Naturally Occurring Asbestos Potential (NOA)

Category	On the Property?	Within Buffer?
Not identified	-	-

Topography

Topography	22-26mAHD

Section 2 - Hydrogeology

2.1 HYDROGEOLOGY AND GROUNDWATER BORES

Map 5a (2000m Buffer)

	On the Property?	Within Buffer?[1]
Aquifer Type	Porous, extensive aquifers of low to moderate productivity	Porous, extensive aquifers of low to moderate productivity
Drinking Water Catchments	Not identified	Not identified
Protected Riparian Corridor	Not identified	South Creek Werrington Creek
UPSS Environmentally sensitive zone	Not identified	Yes
Wetlands	Not identified	Not identified
Groundwater Bores	Not identified	Yes, see 2.1.1 and 2.1.2

Table 2.1.1. Groundwater Bore Details

Groundwater Bore ID	Authorised Purpose	Completion Date	Drilled Depth (m)	Final Depth (m)	SWL (m)	Salinity	Yield (L/s)	Distance (m)	Direction
GW113135	Monitoring	28-05-09	6.4	-	-	-	-	273.1	south
GW113130	Monitoring	22-04-09	5	5	-	-	-	312.6	south
GW113134	Monitoring	28-05-09	6.1	-	-	-	-	344.3	south
GW113127	Monitoring	21-04-09	5.4	-	-	-	-	378.2	south
GW113136	Monitoring	28-05-09	6.1	-	-	-	-	392.7	south
GW113131	Monitoring	27-05-09	6.4	-	-	-	-	394.5	south
GW113132	Monitoring	27-05-09	6.4	-	-	-	-	395.1	south
GW113128	Monitoring	21-04-09	5.6	-	-	-	-	406.6	south
GW113129	Monitoring	28-04-09	6.8	-	-	-	-	513.2	south
GW113133	Monitoring	27-05-09	6.5	-	-	-	-	520.1	south
GW111462	Monitoring	31-03-11	9.77	11.02	-	-	0.3	721.1	north
GW111463	Monitoring	31-03-11	9.18	9.77	-	-	0.3	739.6	north
GW115314	Null	N/A	0	0	-	-	-	892.7	south-east
GW111461	Monitoring	31-03-11	11.02	9.18	-	-	0.3	920	north
GW115315	Null	N/A	6.5	0	-	-	-	928.2	south-east

Groundwater Bore ID	Authorised Purpose	Completion Date	Drilled Depth (m)	Final Depth (m)	SWL (m)	Salinity	Yield (L/s)	Distance (m)	Direction
GW115305	Null	N/A	8	-	-	-	-	936.1	south-east
GW109587	Monitoring	15-01-03	8.2	8.2	6.7	-	-	937.8	south-east
GW109588	Monitoring	16-01-03	8.2	8.2	2.62	-	-	953.3	south-east
GW109586	Monitoring	15-01-03	1.5	1.5		-	-	959.7	south-east
GW109585	Monitoring	14-01-03	8.2	-	2.4	-	-	966.1	south-east
GW109584	Monitoring	14-01-03	8.2	8.2	2.89	-	-	979.9	south-east
GW112625	Monitoring	27-08-09	6	6	-	-	-	1251.3	south-east
GW112626	Monitoring	27-08-09	6	6	-	-	-	1259.5	south-east
GW112627	Monitoring	27-08-09	6	6	-	-	-	1284.4	south-east
GW115575	Null	N/A	-	-	-	-	-	1339.9	north-west
GW115574	Null	N/A	-	-	-	-	-	1349	north-west
GW115584	Null	N/A	-	-	-	-	-	1360.4	north-west
GW115585	Null	N/A	-	-	-	-	-	1377.6	north-west
GW115583	Null	N/A	-	-	-	-	-	1647.3	north-west
GW115582	Null	N/A	-	-	-	-	-	1647.8	north-west
212037	Unknown	-	-	-	-	-	-	1676.6	north-east
GW115576	Null	N/A	-	-	-	-	-	1802.2	north-west
GW115577	Null	N/A	-	-	-	-	-	1817.1	north-west

Note: The use of the symbol "-" or N/A indicates that no records were found.

Table 2.1.2. Groundwater Bore Driller Lithology Details

Groundwater Bore ID	From Depth – To Depth (m) Lithology	Distance (m)	Direction
GW113135	#N/A	273.10	south
GW113130	#N/A	312.60	south
GW113134	#N/A	344.30	south
GW113127	#N/A	378.20	south
GW113136	#N/A	392.70	south
GW113131	#N/A	394.50	south
GW113132	#N/A	395.10	south
GW113128	#N/A	406.60	south
GW113129	#N/A	513.20	south
GW113133	#N/A	520.10	south

GW111462	0m-0.15m Fill 0.15m-0.25m Fill road base 0.25m-3.8m Clay mottled,red/brown 3.8m-4m Clay,red,stiff,slightly dry 4m-6.8m Clay yellow brown,not stiff 6.8m-8.45m Shale,weathered brown/grey 8.45m-11.02m Shale,silver/grey,weathered,dry	721.10	north
GW111463	0m-0.2m Fill , road base 0.2m-0.4m Sand,brown,fine,slightly damp 0.4m-3m Clay grading to red clays,dry,miottled 3m-3.6m Sand yellow/light brown,dry,loose 3.6m-4.2m Sand,orange/ brown,dry,loose 4.2m-5m Sand,light brown,not plastic,loose 5m-5.45m Clay mottled,yellow,grey 5.45m-7m Shale.silvery grey,weathered 7m-8m Shale,grey brown,weathered,brittle 8m-9.77m Shale,light grey,hard and dry.brittle	739.60	north
GW115314	#N/A	892.70	south-east
GW111461	0m-0.2m Fill 0.2m-0.4m Sand fill,wet 0.4m-0.6m Clay mottled 0.6m-4.6m Clay red ,mottled,plastic 4.6m-6.6m Clay yellow brown,very plastic 6.6m-7.8m Shale weathered grey 7.8m-9.18m Shale silver grey,weathered	920.00	north
GW115315	#N/A	928.20	south-east
GW115305	#N/A	936.10	south-east
GW109587	0m-0.2m Concrete 0.2m-0.4m Fill 0.4m-3.5m Clay,very stiff 3.5m-5m Gravelly clay 5m-7.5m Clay,firm brown 7.5m-8.2m Shale,white,grey	937.80	south-east
GW109588	0m-0.2m Concrete 0.2m-0.7m Fill,clay 0.7m-2.6m Clay,firm,orange 2.6m-4.2m Gravelly clay 4.2m-7.2m Clay,firm,brown,some gravel 7.2m-8.2m Shale,grey,hard	953.30	south-east
GW109586	0m-0.2m Concrete 0.2m-0.7m Fill,clay 0.7m-1.5m Clay,firm to stiff	959.70	south-east
GW109585	0m-0.2m Concrete 0.2m-0.6m Fill,clay 0.6m-3.9m Clay,mottled red,brown 3.9m-6.2m Gravelly clay 6.2m-8.2m Shale	966.10	south-east
GW109584	0m-0.2m Concrete 0.2m-0.7m Clay 0.7m-1.6m Clay,grey,orange 1.6m-2.2m Gravelly clay,hard , dry 2.2m-5.5m Clay,moisture,firm 5.5m-8.2m Shale,bedrock,dark grey	979.90	south-east
GW112625	0m-1m Fill 1m-3m Clay Minor Sand 3m-6m Clay Soft	1251.30	south-east
GW112626	0m-1m Fill 1m-3m Claly Minor Sand 3m-6m Clay Soft	1259.50	south-east

GW112627	0m-1m Fill 1m-3m Clay Minor Sand 3m-6m Clay Soft	1284.40	south-east
GW115575	#N/A	1339.90	north-west
GW115574	#N/A	1349.00	north-west
GW115584	#N/A	1360.40	north-west
GW115585	#N/A	1377.60	north-west
GW115583	#N/A	1647.30	north-west
GW115582	#N/A	1647.80	north-west
212037	#N/A	1676.60	north-east
GW115576	#N/A	1802.20	north-west
GW115577	#N/A	1817.10	north-west

Note: The use of the symbol "-" or N/A indicates that no records were found.

2.2 HYDROGEOLOGY AND OTHER BOREHOLES

Map 5b (500m Buffer)

	On the Property?	Within Buffer?
Groundwater Vulnerability	Not identified	Not identified
Groundwater Exclusion Zones[1,2]	Not identified	Not identified
Hydrogeologic Unit	Late Permian/Triassic sediments (porous media - consolidated)	Late Permian/Triassic sediments (porous media - consolidated) Surficial Sediment Aquifer (porous media - unconsolidated)
Other known borehole investigations	Not identified	Yes, see 2.2.1

[1] - Botany Groundwater Management Zones (BGMZ): Zone 1 – the use of groundwater remains banned; Zones 2 to 4 – domestic groundwater use is banned, especially for drinking water, watering gardens, washing windows and cars, bathing, or to fill swimming pools.

[2] - Williamtown Groundwater Management Zones (WGMZ): Primary Management Zone – this area has significantly higher levels of PFAS detected and therefore, the strongest advice applies. Secondary Management Zone – this area has some detected levels of PFAS; Broader Management Zone – the topography and hydrology of the area means PFAS detections could occur now and into the future.

Groundwater Dependent Ecosystems

Site	On the Property?	Within Buffer?
Ecosystems that rely on the Surface expression of Groundwater	Not identified	High potential for GW interaction
Ecosystems that rely on Subsurface presence of Groundwater	Not identified	High potential for GW interaction Moderate potential for GW interaction Low potential for GW interaction

Table 2.2.1. Other known borehole investigations (Coal Seam Gas (CSG), Petroleum Wells and Other Boreholes) (500m buffer)

Borehole ID	Purpose	Project	Client/License	Date Drilled	Depth (m)	Distance (m)	Direction
BH107	Borehole	Additional Contamination Investigation, Charles St, St Marys		11-Dec-13	1.5	272.1	north-east
BH112	Borehole			13-Dec-13	2	292.4	north-east
BH119	Borehole			13-Dec-13	2	305.4	north-east
BH113	Borehole			13-Dec-13	2	305.9	north-east
BH101/MW101	Borehole			11-Dec-13	8	307.8	north-east
BH105/MW105	Borehole			12-Dec-13	8.5	318.1	north-east

Borehole ID	Purpose	Project	Client/License	Date Drilled	Depth (m)	Distance (m)	Direction
BH106	Borehole			11-Dec-13	2.7	321.6	north-east
BH108	Borehole			12-Dec-13	1	326.9	north-east
BH120	Borehole			13-Dec-13	2	330.3	north-east
BH109	Borehole			12-Dec-13	1.5	339.7	north-east
BH102/MW102	Borehole			11-Dec-13	7.5	348.9	north-east
BH115	Borehole			13-Dec-13	2	359.2	north-east
BH103/MW103	Borehole			12-Dec-13	8.5	361.6	north-east
BH117	Borehole			13-Dec-13	2	362.1	north-east
BH110	Borehole			12-Dec-13	1	380.3	north-east
BH116	Borehole			13-Dec-13	2	386	north-east
BH118	Borehole			13-Dec-13	2	389.9	north-east
BH104/MW104	Borehole			12-Dec-13	7.5	396.9	north-east
BH111	Borehole			12-Dec-13	1.5	413.2	north-east

Section 3 – Environmental Registers, Licences and Incidents

3.1 CONTAMINATED LAND PUBLIC REGISTER

Map 6 (1000m Buffer)

Contaminated Land Record of Notices

Area n⁰	Site Name[2]	Address[1]	Notices	Distance (m)	Direction
3119	Drum Recycler	Vallance Street, ST MARYS	Notices relating to this site (5 former)	675	North-east
3070	Solveco	38 Links Road, ST MARYS	Notices relating to this site (2 current and 10 former)	718	North-east

1. Some addresses do not contain specific street numbers. Records identified as being in the surrounding area have been added for information.
2. Former NSW EPA sites. These sites have been removed from the Record of Notices and/or the Sites Notified lists and are kept here for information purposes only.

Sites Notified as Contaminated to the EPA

Site n⁰	Site Name[2]	Address[1]	Activity that caused Contamination	EPA Site Management Class[3]	Distance (m)	Direction
1447	Chemcolour Industries	19-25 Anne Street ST MARYS	Chemical Industry	Regulation under CLM Act not required	624	South-east
3070	Solveco	38 Links Road ST MARYS	Other Industry	Contamination currently regulated under CLM Act	675	North-east
102	7-Eleven (former Mobil) Service Station	2 Christie Street ST MARYS	Service Station	Regulation under CLM Act not required	871	South-east

1. Some addresses do not contain specific street numbers. Records identified as being in the surrounding area have been added for information.
2. Former NSW EPA sites. These sites have been removed from the Record of Notices and/or the Sites Notified lists and are kept here for information purposes only.
3. The EPA maintains a record of sites that have been notified to the EPA by owners or occupiers as contaminated land. The sites notified to the EPA and recorded on the register are at various stages of the assessment and/or remediation process. Table 5 outlines the possible management status that can be attributed to a registered contaminated site.

Table 3.3.1. EPA Site Management Class Explanation

EPA Site Management Class	
Under Assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or Protection of the Environment Operations Act 1997. Alternatively, the EPA may require information via a notice issued under s77 of the Contaminated Land Management Act 1997 or issue a Preliminary Investigation Order.
Regulation under the CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the Contaminated Land Management Act 1997 is not required.
Regulation being finalised	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997. A regulatory approach is being finalised.
Contamination currently regulated under the CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record.
Contamination currently regulated under the POEO Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the Protection of the Environment Operations Act 1997 (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.

EPA Site Management Class	
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the Environmental Planning and Assessment Act 1979 (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). The contamination was addressed under the CLM Act.
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the Environmental Planning and Assessment Act 1979 (EP&A Act).
Contamination was addressed via the planning process (EP&A Act)	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the Environmental Planning and Assessment Act 1979 (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the Contaminated Land Management Act 1997 (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record.

3.2 POTENTIALLY CONTAMINATED AREAS

Map 6 (1000m Buffer)

Defence Sites

Site name	RCIP*	Description	Distance (m)	Direction
St Marys Munitions Factory		The St Marys factory is the largest extant site from the Second World War. The remains of an ammunition building and bunkers which were once part of a munitions factory and storage facility are located within the St Marys Industrial Estate, which was built on the site of the wartime complex. Designed for explosives, the buildings were erected during World War II. A number of tunnels and trenches remain. As part of the development associated with the establishment of the munitions factory, a number of houses were built as staff cottages. There were two fire stations, one each in the Administrative and Pyrotechnic areas. Production commenced in November 1942 producing flame floats for the RAAF. At the end of the war in August 1945, production was quickly wound down and the buildings on the old site were leased and then sold to private firms, evolving into the industrial area we see today. With the advent of the Korean War in the early 1950s, the Commonwealth Government perceived a need to increase the production of munitions and built a new filling factory at St. Marys on a site adjacent to the old wartime factory. It was officially opened by the then Prime Minister, Robert Menzies, on 17 December 1957. With the race to rebuild the St Marys Munitions Filling Factory, the contractor used un-trialled roofing materials made of compressed straw sheeting. In the first heavy rains, the uncured grain started growing, the roof grew a wonderful crop of wheat. The factory commenced production in early 1958 and remained operational until late 1995. (Australia For Everyone - Pocket-Oz websites)	0	onsite

*RCIP (Regional Contamination Investigation Program)

Former Gasworks Sites

Site name	Description	Source	Distance (m) *	Direction
Not identified	-	-	-	-

PFAS Sites

Site name	Description	Source	Distance (m) *	Direction
Not identified	-	-	-	-

*2km search. If the site is not within 1km buffer, it will not be shown on the map.

3.3 LICENSING UNDER THE POEO ACT

Map 7 (500m Buffer)

Licences

EPL Number	Licence holder	Location Name	Premise Address[1]	Fee Based Activity	Distance (m)	Direction
13217	TYRECYCLE PTY LTD	TYRECYCLE	81-85 Christie Street, ST MARYS	Non-thermal treatment of waste tyres, Waste storage - waste tyres	167	south-west
20271	CLEANAWAY CO PTY LTD	CLEANAWAY CO PTY LTD	42-46 CHARLES STREET, ST MARYS	Contaminated soil treatment, Non-thermal treatment of hazardous and other waste, Waste storage - hazardous, restricted solid, liquid, clinical and related waste and asbestos waste	193	east
6934	SIMS GROUP AUSTRALIA HOLDINGS LIMITED	SIMS GROUP LIMITED	76 - 100 CHRISTIE STREET, ST MARYS	Scrap metal processing	265	south
13295	SAMOS POLYMERS PTY LTD	Samos Dio	9-15 Kommer Place, ST MARYS	Toxic substances production	267	north
12628	CLEANAWAY CO PTY LTD	OFFSET ALPINE PRINTING	40 CHRISTIE STREET, ST MARYS	Non-thermal treatment of hazardous and other waste, Recovery of general waste, Waste storage - hazardous, restricted solid, liquid, clinical and related waste and asbestos waste	344	south-east
5973	BRANDSTER SERVICES PTY LIMITED	BRANDSTER SERVICES	UNIT 4, 5, 6 & 7; 15 LEE HOLM ROAD, ST MARYS	Non-thermal treatment of hazardous and other waste, Waste storage - hazardous, restricted solid, liquid, clinical and related waste and asbestos waste	364	south-east
20640	J.J. RICHARDS & SONS PTY LTD	J.J. RICHARDS & SONS PTY LTD	8 Kommer Place, ST MARYS	Recovery of general waste, Waste storage - other types of waste	436	north-west
21346	REMONDIS AUSTRALIA PTY LTD	REMONDIS PTY LTD	32-36 CHRISTIE STREET, ST MARYS	Recovery of general waste Waste storage - other types of waste	482	south-east
12208	SYDNEY TRAINS	SYDNEY TRAINS	SYDNEY TRAINS, HAYMARKET	Railway systems activities	Not mapped	south
13421	JOHN HOLLAND RAIL PTY LTD	John Holland Rail Pty Ltd	JOHN HOLLAND RAIL NETWORK, PARRAMATTA	Railway infrastructure operations	Not mapped	south

[1]. Some sites do not contain specific addresses. Records identified as being in the surrounding area have been added for information.

Surrendered Licences still Regulated by EPA

Licence Nº	Licence holder	Location Name	Premise Address[1]	Fee Based Activity	Status	Distance (m)	Direction
1176	BORAL RESOURCES (NSW) PTY LTD	BORAL CONCRETE	136 CHRISTIE STREET, ST MARYS	Concrete works	No longer in force	65	south-east
11688	PYRMONT RAW MATERIALS PTY LTD	WESTERN SYDNEY RAIL FRIEGHT FACILITY	OFF CHRISTIE STREET, ST MARYS, NSW	Crushing, grinding or separating	Revoked	84	south-west
12893	SYDNEY DRUM MACHINERY PTY LTD	SYDNEY DRUM MACHINERY PTY LTD	75 CHRISTIE ST, ST MARYS, NSW, 2760	Non-thermal treatment of hazardous and other waste Container reconditioning	Surrendered	100	south
2017	SIMS ALUMINIUM PTY LIMITED	SIMS ALUMINIUM PTY LIMITED	42-46 CHARLES STREET, ST MARYS, NSW	Non-thermal treatment of hazardous and other waste	Surrendered	202	north-east
2494	SI GROUP-AUSTRALIA PTY LIMITED	SI GROUP-AUSTRALIA PTY LIMITED	72 CHRISTIE STREET, ST MARYS, NSW	Chemical production waste generation Paints/polishes/adhesives production	Surrendered	215	south-east
644	CORINTHIAN INDUSTRIES (AUSTRALIA) PTY LIMITED	CORINTHIAN INDUSTRIES (AUSTRALIA) PTY LTD	17-35 LEE HOLM ROAD, ST MARYS, NSW	Wood or timber milling or processing	Surrendered	400	south-east
20621	ST MARYS RECYCLING PTY LTD	St Marys Recycling Centre	25 Dunheved Cct, ST MARYS, NSW, 2760	Non-thermal treatment of general waste Recovery of general waste Waste storage - other types of waste	Surrendered	424	north-west
2052	SUPERIOR CONSTRUCTION MATERIALS PTY LIMITED	SUPERIOR PREMIX	17 BENT STREET, ST MARYS, NSW	Concrete works	Surrendered	452	south-east

[1]. Some sites do not contain specific addresses. Records identified as being in the surrounding area have been added for information.

Clean Up and Penalty Notices

Location ID	Notice Nº	Notice Type	Licence holder	Location Name	Premise Address[1]	Distance (m)	Direction
256	1540293	s.91 Clean Up Notice	Maganic Brothers and Sister Pty Limited	65 Dunheved Cct, ST MARYS, NSW, 2760	65 Dunheved Cct, ST MARYS, NSW, 2760	56	north-west
258	1106659	s.91 Clean Up Notice	SYDNEY DRUM MACHINERY PTY LTD	SYDNEY DRUM MACHINERY PTY LTD	75 CHRISTIE ST,	112	south
258	1126545	s.91 Clean Up Notice	SYDNEY DRUM MACHINERY PTY LTD	SYDNEY DRUM MACHINERY PTY LTD	75 CHRISTIE ST,	112	south
258	1502921	s.91 Clean Up Notice	SYDNEY DRUM MACHINERY PTY LTD	SYDNEY DRUM MACHINERY PTY LTD	75 CHRISTIE ST,	112	south

Location ID	Notice Nº	Notice Type	Licence holder	Location Name	Premise Address[1]	Distance (m)	Direction
258	1503352	s.91 Clean Up Notice	SYDNEY DRUM MACHINERY PTY LTD	SYDNEY DRUM MACHINERY PTY LTD	75 CHRISTIE ST,	112	south
258	1503772	s.91 Clean Up Notice	SYDNEY DRUM MACHINERY PTY LTD	SYDNEY DRUM MACHINERY PTY LTD	75 CHRISTIE ST,	112	south
258	1503916	s.91 Clean Up Notice	SYDNEY DRUM MACHINERY PTY LTD	SYDNEY DRUM MACHINERY PTY LTD	75 CHRISTIE ST,	112	south
255	1560062	Penalty Notice	CLEANAWAY CO PTY LTD	Tox Free Australia St Marys	42-46 CHARLES STREET, ST MARYS, NSW 2760	202	north-east
254	1540221	Penalty Notice	TRUEGAIN PTY. LIMITED	Truegain Pty Ltd	38 Charles Sreet, ST MARYS, NSW 2760	245	north-east
254	1536335	s.91 Clean Up Notice	TRUEGAIN PTY. LIMITED	Truegain Pty Ltd	38 Charles Sreet, ST MARYS, NSW 2760	245	north-east
259	1557778	s.91 Clean Up Notice	SIMS GROUP AUSTRALIA HOLDINGS LIMITED	SIMS GROUP LIMITED	76 - 100 CHRISTIE STREET,	265	south

[1]. Some sites do not contain specific addresses. Records identified as being in the surrounding area have been added for information.

3.4 NATIONAL POLLUTANT INVENTORY (NPI)

Map 7 (500m Buffer)

Facility name	Address	Primary ANZSIC Class	Latest report	Distance (m)	Direction
Not identified	-		-	-	-

3.5 PUBLIC REGISTER OF PROPERTIES AFFECTED BY LOOSE-FILL ASBESTOS INSULATION

Map 7 (onsite)

Address	Match Found
Not identified	-

Section 4 – Other Potentially Contaminating Activities

4.1 POTENTIALLY CONTAMINATING ACTIVITIES

Map 8a (500m Buffer)

Cattle Dip Sites

Site name	Location	Status*	Distance (m)	Direction
Not identified	-	-	-	-

Dry Cleaners

Site name	Location	Status*	Distance (m)	Direction
Not identified	-	-	-	-

Fire Rescue Sites

Site name	Location	Status*	Distance (m)	Direction
Not identified	-	-	-	-

Gas Terminals

Site name	Operator	Location	Status*	Distance (m)	Direction
Not identified	-		-	-	-

Liquid Fuel Depots/Terminals

Site name	Owner	Location	Status*	Distance (m)	Direction
Not identified	-	-	-	-	-

Mines and Quarries

Deposit Name	Method	Description	Status*	Distance (m)	Direction
Not identified	-	-	-	-	-

Petrol Stations

Site name	Owner	Location	Status*	Distance (m)	Direction
Shell Coles Express St Marys	Shell	61-63 CHRISTIE ST, ST MARYS, 2760, NSW	Current	184	south

Power Stations

Site name	Owner	Location	Status*	Distance (m)	Direction
Not identified	-	-	-	-	-

Substation / Switching Stations

Site name	Owner	Location	Status*	Distance (m)	Direction
Not identified	-	-	-	-	-

Telephone Exchanges

Site name	Location	Status*	Distance (m)	Direction
Not identified	-	-	-	-

Waste Management Facilities

Site name	Type	Location	Status*	Distance (m)	Direction
Penrith Community Recycling Centre	Waste Management Facility	Gate 3/96 Dunheved Cct, St Marys NSW 2760	Current	216	north-east
Cleanaway St Marys Technical Services	Waste Management Facility	42-46 Charles St, St Marys NSW 2760	Current	290	north-east
Anyfil Skip Bins	Waste Management Facility	3/15 Lee Holm Rd, St Marys NSW 2760	Current	374	south-west
Cleanaway St Marys Liquid Waste Services	Waste Management Facility	40 Christie St, St Marys NSW 2760	Current	406	south-east
Sims Group Limited	Waste Management Facility	76 Christie St, St Marys NSW 2760	Current	417	south-west
Koorey Liquid Waste Specialist	Waste management service	34/38 Christie St, St Marys NSW 2760	Current	454	south-east
JJ's Waste & Recycling	Waste management service	8 Kommer Pl, St Marys NSW 2760	Current	478	north-west

Wastewater Treatment Facilities

Site name	Operator	Location	Status*	Distance (m)	Direction
Not identified	-	-	-	-	-

***Status:**
Data is current as when this report was created. However due to the turnover of business locations, some addresses may be former.
Current: business that are operational on the day this report was issued.
Former: business that have been closed or discontinued 1 to 2 years from the day this report was issued. All former sites older than 2 years will be reported in the 'Historical commercial and trade data' section in this report.

4.2 CURRENT COMMERCIAL AND TRADE DATA

Map 8b (200m Buffer)

Current Commercial and Trade Data

Site name [1]	Category	Location	Status [2]	Distance (m)	Direction
Pallets & Platforms	Mobile Pallet Repairs	89 Dunheved Cct St Marys, New South Wales	Current	23.4	east
Manufacturer	Atomic Glass Fencing	91 Dunheved Cct St Marys, New South Wales	Current	40.3	east
Tuning automobile	JE Customs Fabrication	78 Dunheved Cct, St Marys NSW 2760	Current	40.6	north-east
Building materials store	City Access Scaffolding	76 Dunheved Cct, St Marys NSW 2760	Current	47.6	north-east
Metal workshop	ALL About Metal	93 Dunheved Cct, St Marys NSW 2760	Current	95.5	east
Storage facility	Jaybro Bulk Storage Yard	65-75 Dunheved Cct, St Marys NSW 2760	Current	122.7	north
Manufacturing Facility	Nepean Rubber and Plastics	54-74 Dunheved Cct, St Marys NSW 2760	Current	126.8	north-east
Manufacturer	Lisbon Engineering	75 Christie St, St Marys NSW 2760	Current	147.7	south
Repair Facility	Aq Brothers	97B Dunheved Cct, St Marys NSW 2760	Current	162.6	east
Concreting	Western Star Constructions	35A Charles St, St Marys NSW 2760	Current	166.4	north-east
Sheet Metal Fabricators	St Marys Sheetmetal	86 Dunheved Cct, St Marys NSW 2760	Current	175.7	east

[1] Data includes categories associated with potentially contaminating activities. All negligible risk data is not reported.

[2] Status: Data is current as when this report was created. However due to the turnover of business locations, some addresses may be former.
Current: business that are operational on the day this report was issued.
Former: business that have been closed or discontinued 1 to 2 years from the day this report was issued. All former sites older than 2 years will be reported in the historical business section in this report.

Tanks (AST/UST)

ID	Tank type	Description	Status	Distance (m)	Direction
Not identified	-		-	-	-

Note: This is not an exhaustive list of all existing tanks.

4.3 FORMER POTENTIALLY CONTAMINATED LAND

Map 8c (500m Buffer)

Contaminated Legacy Areas

Site Name	Description	Source	Distance (m)	Direction
Not identified	-	-	-	-

Note: This section includes known contaminated areas such as James Hardies Asbestos waste legacy areas, Pasminco Smelter and Uranium processing site.

Derelict Mines and Quarries

Site name	Method	Description	Source	Distance (m)	Direction
Not identified	-	-	-	-	-

Historical Landfills

Site name	Description	Source	Distance (m)	Direction
Not identified	-		-	-

Unexploded Ordnance (UXO) Areas

Site name	Category	Description	Source	Distance (m)	Direction
Not identified	-	-	-	-	-

4.4 HISTORICAL COMMERCIAL AND TRADE DATA (not mapped)

1930 Historical Commercial & Trade Directory Data

Activity	Name	Address	Positional accuracy	Distance (m)	Direction
Not identified	-	-	-	-	-

1940 Historical Commercial & Trade Directory Data

Activity	Name	Address	Positional accuracy	Distance (m)	Direction
Not identified	-	-	-	-	-

1950 Historical Commercial & Trade Directory Data

Activity	Name	Address	Positional accuracy	Distance (m)	Direction
Not identified	-	-	-	-	-

1965 Historical Commercial & Trade Directory Data

Activity	Name	Address	Positional accuracy	Distance (m)	Direction
Grocers - W/Salers	Neely W	75, Christie,NSW	address	154.7	south-west

1970 Historical Commercial & Trade Directory Data

Activity	Name	Address	Positional accuracy	Distance (m)	Direction
Laminates Boards & Panels - Retail & W/Sale	Formica Plastics Pty Ltd	216 Links Road, St Marys,NSW	address	30.3	south-west
Engineers - Maintenance & Installation	FRANCIS INSTALLATION & MAINTENANCE PTY LTD	Links Road, St. Marys	address	186	south-west

1980 Historical Commercial & Trade Directory Data

Activity	Name	Address	Positional accuracy	Distance (m)	Direction
Sack & Bag M/Factrs &/Or W/Salers	Rural Bag & Sack Co Pty Ltd	85 Dunheved Circuit, St. Marys,NSW	address	17.7	north
Laminates Boards & Panels - Retail & W/Sale	Corinite	216 Links Road, St Marys,NSW	address	30.3	south-west
Laminates Boards & Panels - Retail & W/Sale	Corinite (Formica Plastics Pty Ltd)	216 Links Road, St. Marys,NSW	address	30.3	south-west
Laminates Boards & Panels - Retail & W/Sale	Corinite	216 Links Road, St. Marys,NSW	address	30.3	south-west
Laminates Boards & Panels - Retail & W/Sale	Formica Plastics Pty Ltd	216 Links Road, St. Marys,NSW	address	30.3	south-west
Veterinary Instruments &/Or Supplies	Chess Chemicals Australia Pty Ltd	89 Dunheved Circuit, St. Marys,NSW	address	30.3	east
Printers - General	Peter Glenn Pennants Textiles Motif Printers	91 Dunheved Circuit, St. Marys,NSW	address	35.8	east
Printers - General	Peter Glenn Pennants Textiles Motif Printers	91 Dunheved Circuit, St. Marys,NSW	address	35.8	east

Activity	Name	Address	Positional accuracy	Distance (m)	Direction
Cabinetry Makers	Herb's Joinery & Kitchen Cabinets	105 Charles St, St. Marys,NSW	address	116.7	east
Kitchens Renovations & Equipment- New	Herb's Joinery & Kitchen Cabinets	105 Charles St., St. Marys,NSW	address	116.7	east
Labels - Plastic Metal Paper Foil	Alpha Printing Specialists Pty Ltd	105 Charles St., St. Marys,NSW	address	116.7	east
Printers - General	Alpha Printing Specialists Pty Ltd	105 Charles St., St. Marys,NSW	address	116.7	east
Steel Fabrication & M/Factrs	Up-rite Steel Fabrications	101 Charles St., St. Marys,NSW	address	116.7	east
Building - Supplies & Hardware	Construction Components (Timber) Pty Ltd	37 Charles St., St. Marys,NSW	address	145.2	east
Cabinetry Makers	Aifren Kitchens	217 Links Road, St. Marys,NSW	address	150.2	north-west
Boat Motors & Outboards	C & C Auto-Care	63 Dunheved Circuit, St. Marys,NSW	address	153.9	north
Concrete - Mixing & Vibrating Equipment	Rheem Australia Ltd	75 Christie St. (Plant), St. Marys,NSW	address	154.7	south-west
Concrete - Pumping	Rheem Australia Ltd	75 Christie St. (Plant), St. Marys,NSW	address	154.7	south-west
Electrical W/Salers	Rheem Australia Ltd	75 Christie St., St. Marys,NSW	address	154.7	south-west
Smallgoods M/Factrs & W/Salers	Oscar Continental Smallgoods	97b Dunheved Circuit, St. Marys,NSW	address	166.1	east
Metal - Merchants	Affinity Metals Pty Ltd	88 Dunheved Circuit, St. Marys,NSW	address	185.4	east
Metal - Non-Ferrous	Affinity Metals Pty Ltd	88 Dunheved Circuit, St. Marys,NSW	address	185.4	east
Silver-Lead-Zinc Ore Mining	Affinity Metals Pty Ltd	88 Dunheved Circuit, St. Marys,NSW	address	185.4	east

1990 Historical Commercial & Trade Directory Data

Activity	Name	Address	Positional accuracy	Distance (m)	Direction
Roof Construction Specialists	Precision Frames & Trusses	89 Dunheved Circuit, St. Marys,NSW	address	30.3	east
Waste Reduction & Disposal Equipment & Machinery	Rethmann Australian Waste Services Pty Ltd	89 Dunheved Circuit, St Marys,NSW	address	30.3	east
Powder Coating & Anodising Services	Aus-Coat (steel, aluminium, pre-galvanised & hot dipped galvanised)	91 Dunheved Circuit, St Marys,NSW	address	35.8	east
Printers - General	Peter Glenn Pty Ltd	91 Dunheved Circuit, St Marys,NSW	address	35.8	east
Engineers - Motor & Repairers	Hudson Ron Mechanical Repairs Pty Ltd	91a Dunheved Circuit, Dunheved,NSW	address	55.9	east
Steel Fabrication & M/Factrs	D.A.M. Steel Fabrication	217 Links Road, St Marys,NSW	address	150.2	north-west
Electrical W/Salers	Electrical Board Makers Pty Ltd	75 Dunheved Circuit, St. Marys,NSW	address	150.5	north
Industrial Capacitors	Electrical Boardmakers	75 Dunheved Circuit, St Marys,NSW	address	150.5	north
Transport & Transportation Service	Westpoint Transport (1974)	75 Dunheved Circuit, St Marys,NSW	address	150.5	north

Activity	Name	Address	Positional accuracy	Distance (m)	Direction
Sheet Metal Workers	St. Mary's Sheet Metal	86 Dunheved Circuit, St. Marys,NSW	address	173.3	east
Engineers - Motor & Repairers	Truline Automotive Services	Corner of Links Road & Vallance Street, Dunheved,NSW	address	186	south-west

2005 Historical Commercial & Trade Directory Data

Activity	Name	Address	Positional accuracy	Distance (m)	Direction
Building - Recycled Materials	As Good As Used Building Material	89 Dunheved Cct, ST MARYS,NSW,2760	address	30.3	east
Rotary Hoeing Services	Aus-Coat Pty Ltd	91 Dunheved Cct, ST MARYS,NSW,2760	address	35.8	east
Joinery Services	Wee Datum Shopfitters	76 Dunheved Cct, ST MARYS,NSW,2760	address	51.6	north-east
Curtains - M/Factrs & W/Salers	Western Suburbs Curtain Manufacturing Pty Ltd	Unit 1/ 78 Dunheved Cct, ST MARYS,NSW,2760	address	55.2	east
Engineers - General	Blue's Point Engineering Pty Ltd	78 Dunheved Cct, ST MARYS,NSW,2760	address	55.2	east
Bathroom Accessories & Equipment - M/Factrs & W/Salers	JQS Pty Ltd	80-82 Dunheved Crt, ST MARYS,NSW,2760	address	105.2	east
Pallets & Platforms Sales & Hire	Pallets Plus	80-82 Dunheved Cct, ST MARYS,NSW,2760	address	105.2	east
Timber - Retailer/Trader	Braidwood Timber Industries	80 Dunheved Cct, ST MARYS,NSW,2760	address	105.2	east
Fencing Materials & Fittings	Singh Fabrication	41 Charles St,ST MARYS,NSW,2760	address	116.7	east
Steel Fabrication & M/Factrs	All About Metal Pty Ltd	95 Dunheved Crt,ST MARYS,NSW,2760	address	125.7	east
Fencing Materials & Fittings	R & G Fencing	37 Charles St,ST MARYS,NSW,2760	address	145.2	east
Engineers - Manufacturing	C & M B Engineering Pty Ltd	97 Dunheved Cct,ST MARYS,NSW,2760	address	146.5	east
Shock Absorbers Suspension Repairs & Replacement Services	Better Springs (MFRG) Pty Ltd	69-73 Christie St,ST MARYS,NSW,2760	address	161.7	south-east
Sheet Metal Workers	Wade Products	97a Dunheved Cct,ST MARYS,NSW,2760	address	166.1	east
Barbeque Supplies & Equipment	Creative Steel Pty Ltd	Unit 5, 29-35 Charles St,ST MARYS,NSW,2760	address	170.6	north-east
Rubbish & Waste Removal	Budskips	35 Charles St,ST MARYS,NSW,2760	address	170.6	north-east
Timber - W/Saler	J P Woods	Unit 1 29-35 Charles St,ST MARYS,NSW,2760	address	170.6	north-east
Sheet Metal Workers	St Marys Sheetmetal	86 Dunheved Cct,ST MARYS,NSW,2760	address	173.3	east
Paint M/Factrs & W/Salers	Dura-Lac	48 Charles St,ST MARYS,NSW,2760	address	201.2	east
Paint M/Factrs & W/Salers	K A R Paints	48 Charles St,ST MARYS,NSW,2760	address	201.2	east
Poultry Processing W/Salers & Supplies	Ronstin Pty Ltd	48 Charles St,ST MARYS,NSW,2760	address	201.2	east

2010 Historical Commercial & Trade Directory Data

Activity	Name	Address	Positional accuracy	Distance (m)	Direction
Kitchens Renovations & Equipment- New	Spray King Australia Pty Ltd	3/16 Links Rd ST MARYS 2760 NSW	address	30.3	south-west
Steel Fabrication & M/Factrs	Nk Fabrications Pty Limnited	2/16 Links Rd ST MARYS 2760 NSW	address	30.3	south-west
Powder Coating & Anodising Services	Aus-Coat Pty Ltd	91 Dunheved Cct ST MARYS 2760 NSW	address	35.8	east
Engineers - General	Blues Point Engineering Pty Ltd	78 Dunheved Cct ST MARYS 2760 NSW	address	55.2	east
Sheet Metal Workers	Metal F X Pty Ltd	91A Dunheved Cct ST MARYS 2760 NSW	address	55.9	east
Hydraulic Supplies & Equipment Sales & Service	777 Engineering	80-82 Dunheved Cct ST MARYS 2760 NSW	address	105.2	east
Plastic Product Retailers	Ludowici Rubber & Plastics	54-74 Dunheved Cct ST MARYS 2760 NSW	address	144	north-east
Rubber M/Factrs & W/Salers	Macam Rubber	54-74 Dunheved Cct ST MARYS 2760 NSW	address	144	north-east
Seals - Mechanical & Oil	Ludowici	54-74 Dunheved Cct ST MARYS 2760 NSW	address	144	north-east
Fencing Materials & Fittings	R & G Fencing	37 Charles St ST MARYS 2760 NSW	address	145.2	east
Shock Absorbers Suspension Repairs & Replacement Services	Better Springs (Mfg) Pty Ltd	69-73 Christie St ST MARYS 2760 NSW	address	161.7	south-east
Steel Fabrication & M/Factrs	All About Metal Pty Ltd	95 Dunheved Crt ST MARYS 2760 NSW	address	165.8	east
Earth Moving &/Or Excavating Equipment & Machinery	Jaybro Civil & Safety Products	35 Charles St ST MARYS 2760 NSW	address	170.6	north-east
Earth Moving &/Or Excavating Equipment & Machinery	Astley Thompson Valtas Solicitors	35 Charles St ST MARYS 2760 NSW	address	170.6	north-east
Rubbish & Waste Removal	Budskips	35 Charles St ST MARYS 2760 NSW	address	170.6	north-east
Sheet Metal Workers	St Marys Sheetmetal	86 Dunheved Cct ST MARYS 2760 NSW	address	173.3	east
Sheet Metal Workers	Bisabat Pty Ltd	86 Dunheved Cct ST MARYS 2760 NSW	address	173.3	east
Paint M/Factrs & W/Salers	Dura-Lac 2000	48 Charles St ST MARYS 2760 NSW	address	201.2	east
Paint M/Factrs & W/Salers	Ronstin Pty Ltd	48 Charles St ST MARYS 2760 NSW	address	201.2	east
Paint M/Factrs & W/Salers	K A R Paints	48 Charles St ST MARYS 2760 NSW	address	201.2	east
Paints & Painting Products - Retail	Hallab's Auto Paints-Panel Beating Supplies & Equipment	48 Charles St ST MARYS 2760 NSW	address	201.2	east

2015 Historical Commercial & Trade Directory Data

Activity	Name	Address	Positional accuracy	Distance (m)	Direction
Powder Coating & Anodising Services	Aus-Coat Pty Ltd	91 Dunheved Cct,St Marys,NSW,2760	address	0	onsite
Sheet Metal Workers	Metal F X Pty Ltd	91a Dunheved Cct,Dunheved,NSW,2760	address	0	onsite

Activity	Name	Address	Positional accuracy	Distance (m)	Direction
Joinery Services	Wee Datum Shopfitters	76 Dunheved Cct,St Marys,NSW,2760	address	55.7	north-east
Steel Fabrication & M/Factrs	All About Metal Pty Ltd	95 Dunheved Crt,St Marys,NSW,2760	address	97.8	east
Bathroom Accessories & Equipment - M/Factrs & W/Salers	JQS Pty Ltd	80- 82 Dunheved Crt,St Marys,NSW,2760	address	105.2	east
Fencing Contractors	Orange Hire	81 Links Rd,St Marys,NSW,2760	address	105.2	east
Plumbers & Gasfitters	Magnadata Pty Ltd	39 Charles St,St Marys,NSW,2760	address	120.8	east
Shock Absorbers Suspension Repairs & Replacement Services	Better Springs (MFRG) Pty Ltd	69- 73 Christie St,St Marys,NSW,2760	address	132.3	south-east
Adhesive Products	3M Australia Pty Limited	2- 74 Dunheved Cct,St Marys,NSW,2760	address	145.4	north-east
Materials Handling Equipment & Storage	Ludowici Australia Pty Ltd	54-74 Dunheved Cct,St Marys,NSW,2760	address	145.4	north-east
Seals - Mechanical & Oil	Ludowici Seals	54- 74 Dunheved Cct,St Marys,NSW,2760	address	145.4	north-east
Seals - Mechanical & Oil	Ludowici	54- 74 Dunheved Cct,St Marys,NSW,2760	address	145.4	north-east
Fencing Materials & Fittings	R & G Fencing	37 Charles St,Dunheved,NSW,2760	address	154.9	east
Sheet Metal Workers	Wade Products	97a Dunheved Cct,St Marys,NSW,2760	address	156.2	east
Theatrical Services &/Or Supplies	Just Foam	97 Dunheved Cct,St Marys,NSW,2760	address	156.2	east
Car Accessories - M/Factrs & W/Salers	Berlex Autoflow	2/ 35 Charles St,St Marys,NSW,2760	address	170.6	north-east
Rubbish & Waste Removal	Budskips	35 Charles St,St Marys,NSW,2760	address	170.6	north-east
Rubbish & Waste Removal	Green Hire Australia	35 Charles St,St Marys,NSW,2760	address	170.6	north-east
Ventilation & Ventilating Systems & Equipment	Maximat	35 Charles St,St Marys,NSW,2760	address	170.6	north-east
Sheet Metal Workers	St Marys Sheetmetal	86 Dunheved Cct,St Marys,NSW,2760	address	170.8	east
Car & Truck Body Builders	Ronstin Pty Ltd	48 Charles St,St Marys,NSW,2760	address	188.5	east
Paint M/Factrs & W/Salers	Dura-Lac 2000	48 Charles St,St Marys,NSW,2760	address	188.5	east
Paint M/Factrs & W/Salers	Hallab's Auto Paints-Panel Beating Supplies & Equipment	48 Charles St,St Marys,NSW,2760	address	188.5	east
Paint M/Factrs & W/Salers	K A R Paints	48 Charles St,St Marys,NSW,2760	address	188.5	east

Historical data positional accuracy and georeferencing results explanation

Positional accuracy	Georeferenced	Description
Address	Located to the address level	*When street address and names fully match.*
Street	Located to the street centroid	*When street names match but no exact address was found. Location is approximate.*
Place	Located to the structure, building or complex	*When building, residential complex or structure name match but no exact address was found. Location is approximate.*

Positional accuracy	Georeferenced	Description
Suburb	Located to the suburb area	*When suburb name match but no exact address was found. Location is approximate.*
Not georeferenced	Not found	*When it was not georeferenced, and address could not be found.*

Land Insight and Resources use a number of different address georeferencing methods and characterised them according to the following criteria: completeness (match rates) and positional accuracy. When address do not contain specific street numbers or a match is not found, records identified as being in the surrounding areas are included for reference.

Section 5 - Other Environmental Constraints

5.1 FEDERAL, STATE AND LOCAL HERITAGE

Map 9 (200m Buffer)

Local Environment Plan (LEP) Heritage

Site ID	Site Name	Class	Significance	Distance (m)*	Direction
Not identified	-	-	-	-	-

National Heritage List (NHL)

Site ID	Site Name	Class	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Register of the National Estate (RNE)

Site ID	Site Name	Class	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Non-Aboriginal heritage item (Local)

Site ID	Site Name	Class	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Non-Aboriginal heritage item (SHR)*

Site ID	Site Name	Listing nº	Plan nº	Distance (m)	Direction
Not identified	-	-	-	-	-

*State Heritage Register

Commonwealth Heritage List (CHL)

Site ID	Site Name	Class	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

World Heritage Area (WHA)

Site ID	Site Name	Inscribed	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

5.2 NATURAL HAZARDS

Map 10 (500m Buffer)

Bush Fire Prone Land (BLP)

Category	On the Property?	Within Buffer?
Vegetation Buffer	Yes	Yes
Vegetation Category 1	Not identified	Yes
Vegetation Category 2	Not identified	Yes

Fire History

Category	On the Property?	Within Buffer?
Not identified	-	-

Flood Hazard

Category	On the Property?	Within Buffer?
Not identified	-	-

5.3 COASTAL MANAGEMENT (STATE ENVIRONMENTAL PLANNING POLICY)

Map 10 (500m Buffer)

Type	On the Property?	Within Buffer?
Coastal Wetlands Proximity Area	-	-
Coastal Wetlands	-	-
Coastal Environment Area Map	-	-
Coastal Use Area Map	-	-

Land Insight

Tower Three, Level 24
300 Barangaroo Avenue
Sydney NSW 2000 Australia
02 8067 8870
info@liresources.com.au
www.liresrouces.com.au

Appendix A

REPORT MAPS

SUBJECT AREA AND SENSITIVE RECEPTORS

MAP 1

Due Diligence Insight

Subject area

Transmission Line

Stormwater channel

Sewer Main

Water Main

Pipeline

Sensitive Receptors

Sports and Recreation Activities

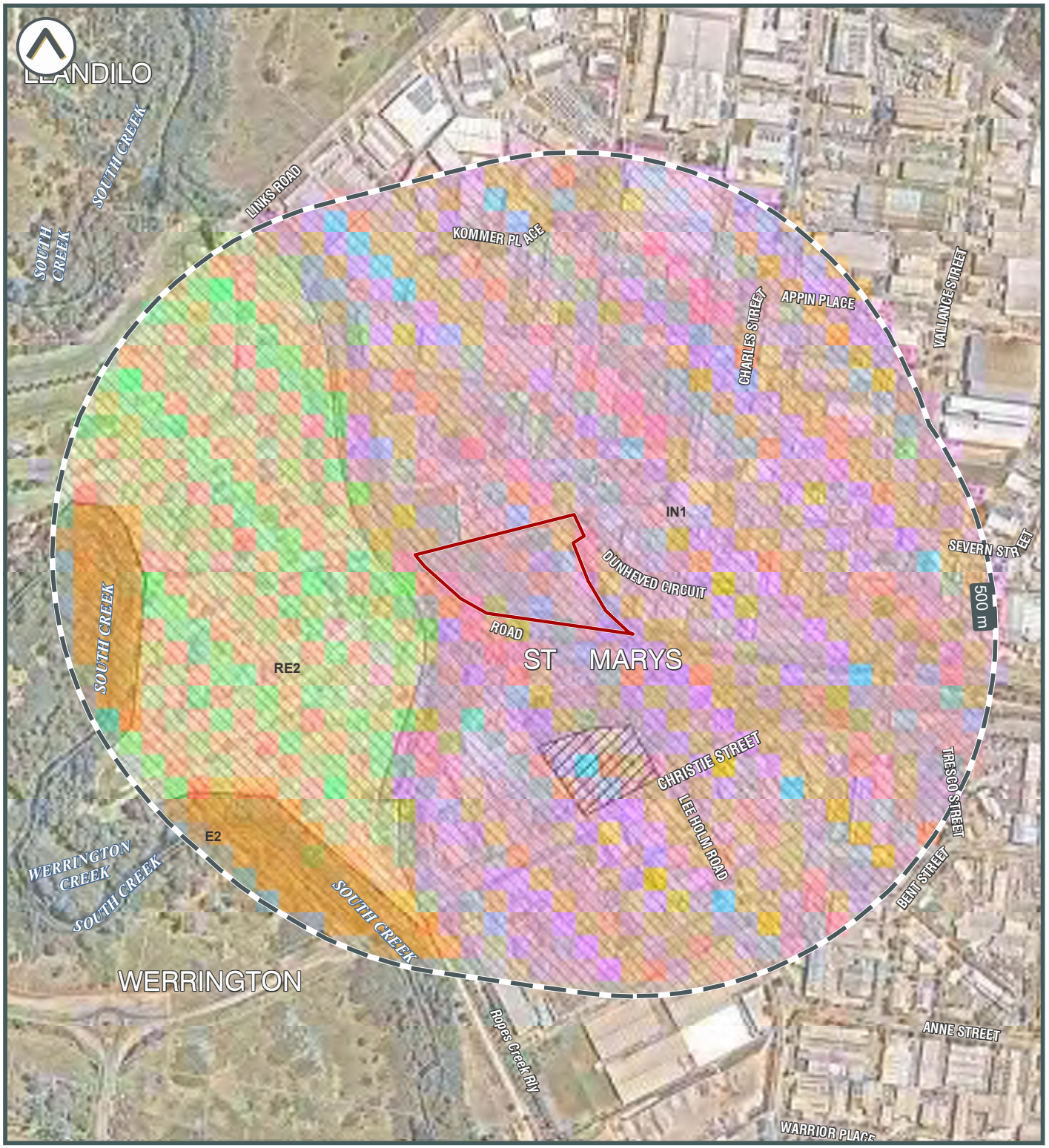
0 50 100 150 200 250m

Land Insight RESOURCES

PLANNING CONTROLS

MAP 2

Due Diligence Insight



Subject area

Additional Permitted Land Uses
Local Provisions

Land Zoning

E2 | Environmental Conservation
IN1 | General Industrial
RE1 | Public Recreation
RE2

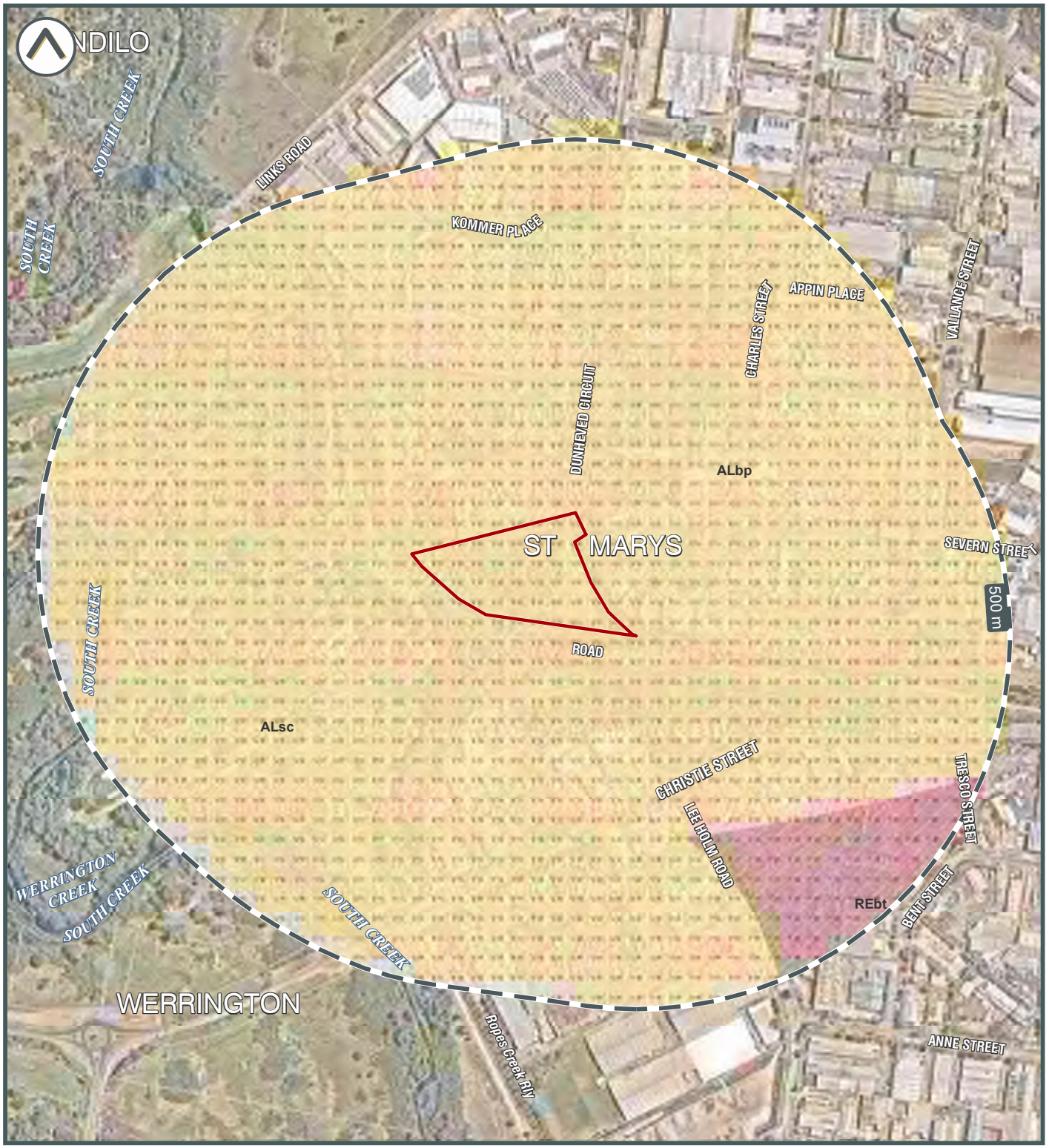
0 200 400 600 800m

Land Insight RESOURCES

SOIL LANDSCAPE AND SALINITY

MAP 3a

Due Diligence Insight



Subject area

Salinity Hazard

VH VH VH VH Very High

Soils Landscape

ALbp | ALLUVIAL

ALsc | ALLUVIAL

REbt | RESIDUAL

Radon Level (Bq/m3)

5-19

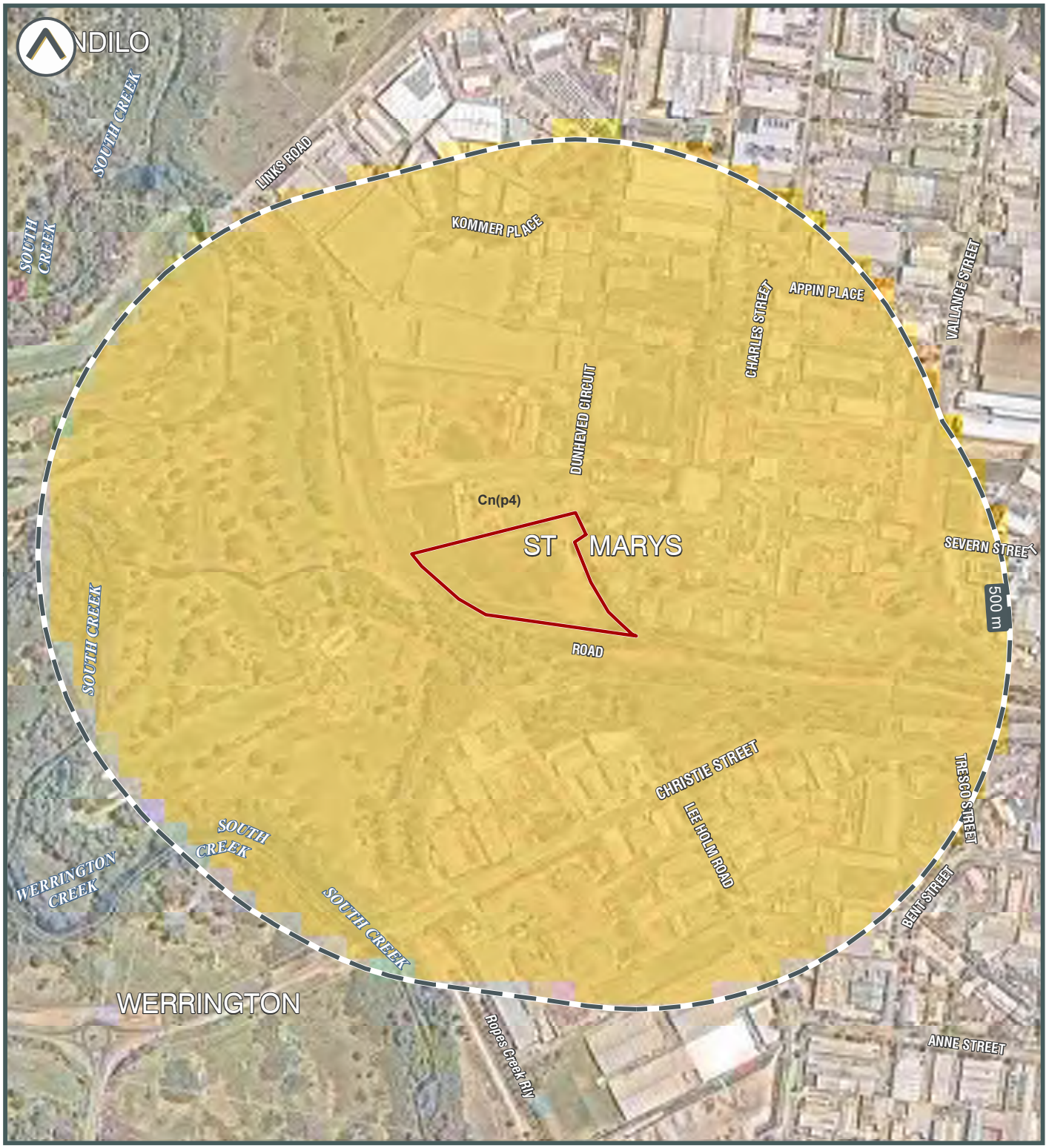
0 200 400 600 800m

Land Insight RESOURCES

ACID SULFATE SOILS

MAP 3b

Due Diligence Insight



Subject area

ASRIS Atlas of Australian Sulfate Soils

Cn(p4) | ASS in inland lakes, waterways, wetlands and riparian zones

Cq(p4) | ASS in inland lakes, waterways, wetlands and riparian zones

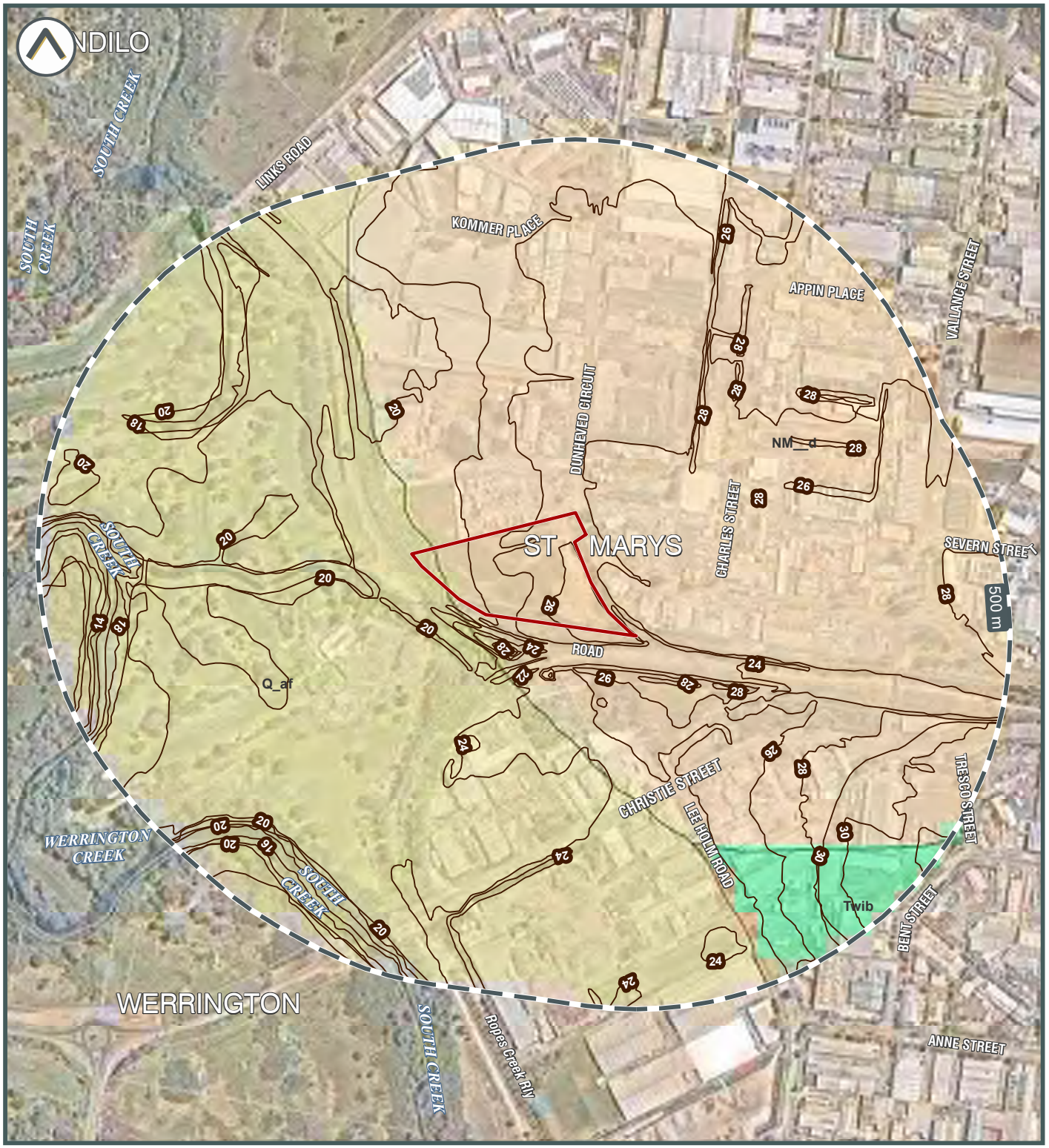
0 200 400 600 800m

Land Insight RESOURCES

GEOLOGY AND TOPOGRAPHY

MAP 4

Due Diligence Insight



Subject area

Topographic contour (m)

Rock Units

CENOZOIC SEDIMENTARY PROVINCE

NM__d

Q_af

PERMO-TRIASSIC BASINS

Twib

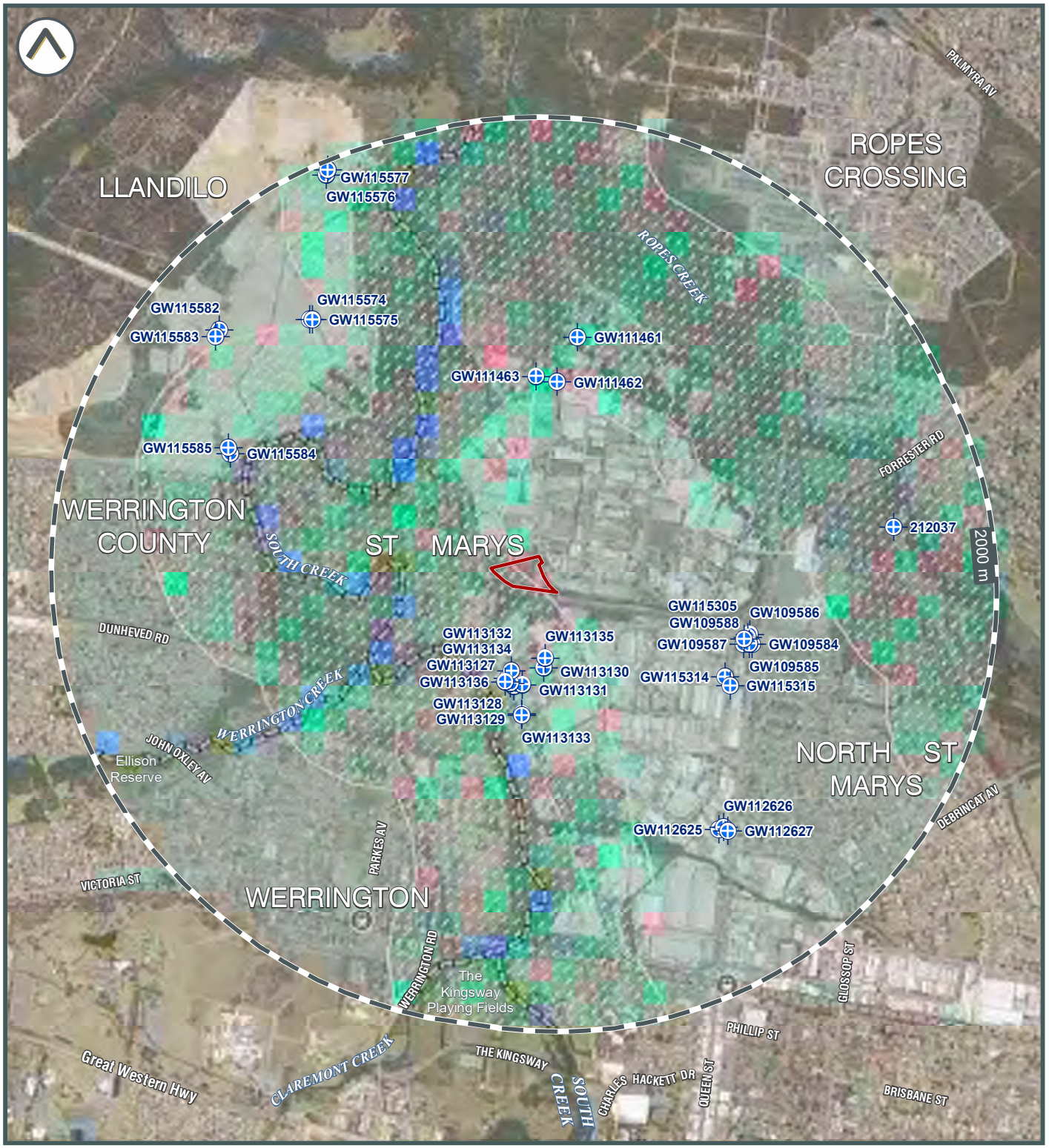
0 200 400 600 800m

Land Insight RESOURCES

HYDROGEOLOGY AND GROUNDWATER BORES

MAP 5a

Due Diligence Insight



Subject area

Protected riparian corridor

UPSS Environmentally Sensitive Zone

Groundwater bores

Aquifer Type

Porous, extensive aquifers of low to moderate productivity

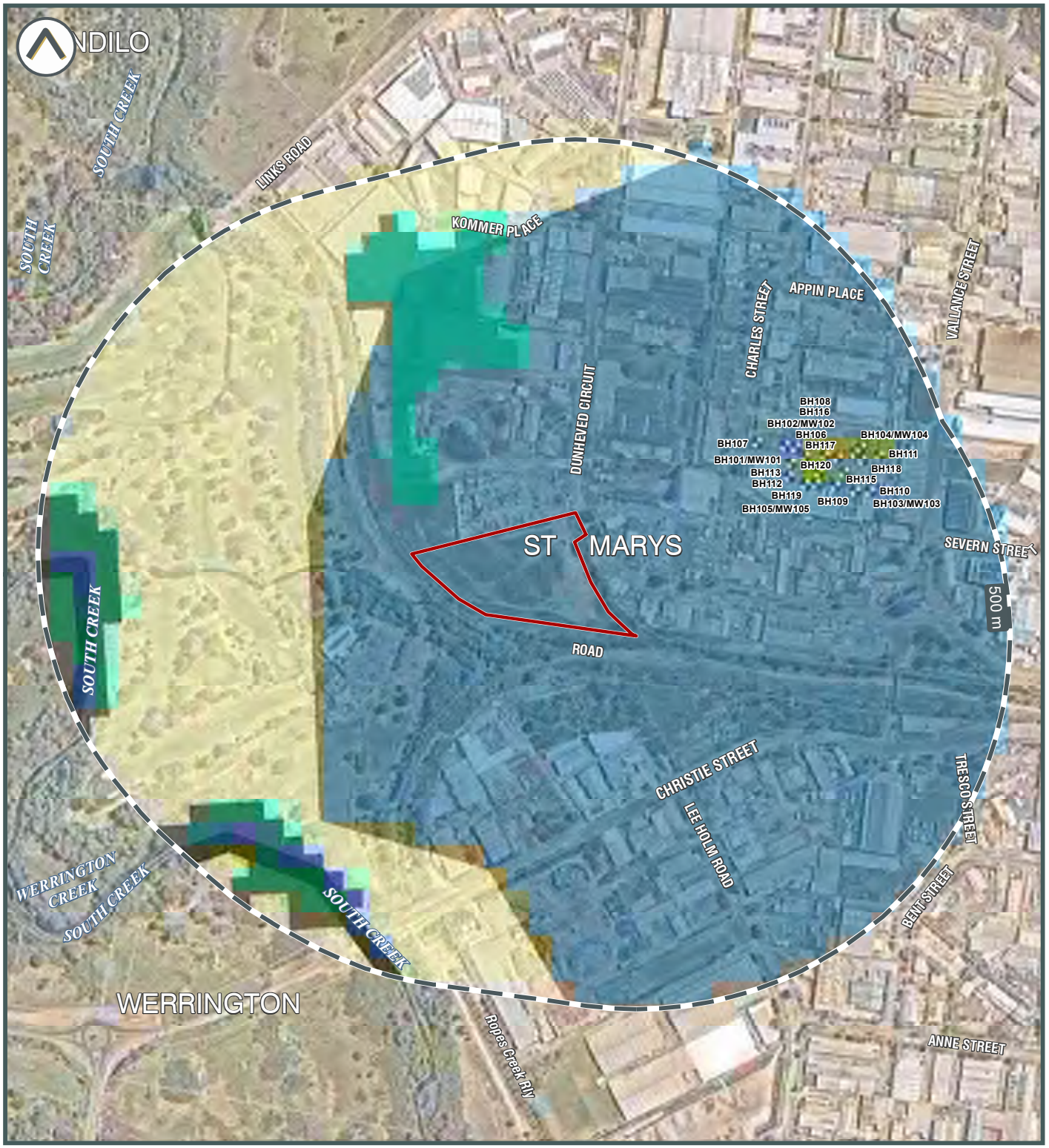
0 500 1,000 1,500 2,000 2,500m

Land Insight RESOURCES

HYDROGEOLOGY AND OTHER BOREHOLES

MAP 5b

Due Diligence Insight



Subject area

Other borehole/monitoring well location

Hydrogeologic Unit

Surficial Sediment Aquifer (porous media - unconsolidated)

Late Permian/Triassic sediments (porous media - consolidated)

Ecosystems that rely on the Surface expression of Groundwater

High potential for GW interaction

Ecosystems that rely on Subsurface presence of Groundwater

High potential for GW interaction

Moderate potential for GW interaction

Low potential for GW interaction

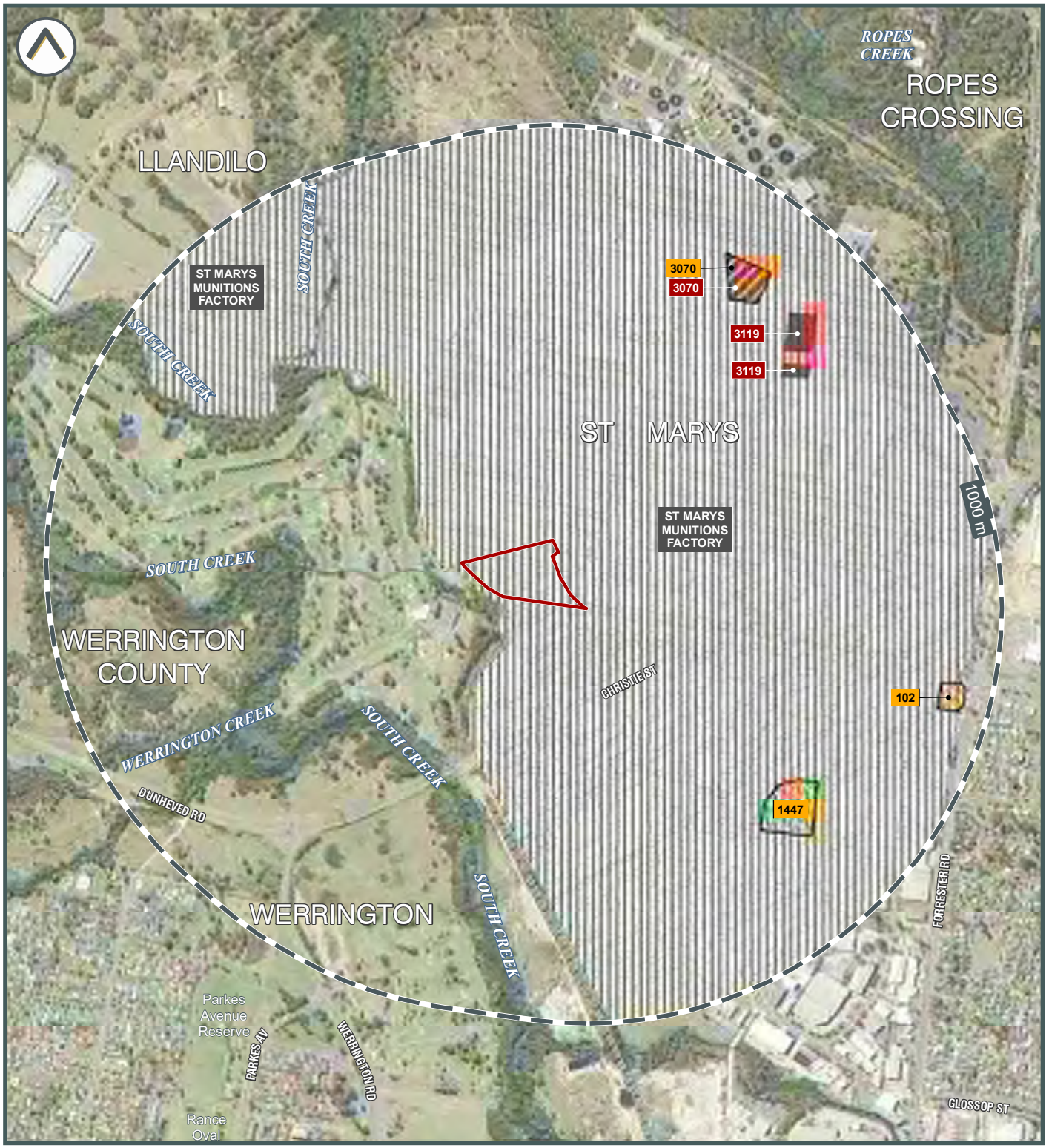
0 200 400 600 800m

Land Insight RESOURCES

CONTAMINATED LAND REGISTER AND POTENTIALLY CONTAMINATED AREAS

MAP 6

Due Diligence Insight



Subject area

Contaminated Land Register (EPA)

Current - Sites notified as contaminated

Contaminated Land Record of Notices

PFAS Sites

Potentially Contaminated Areas

Defence Sites

Former Gasworks Sites

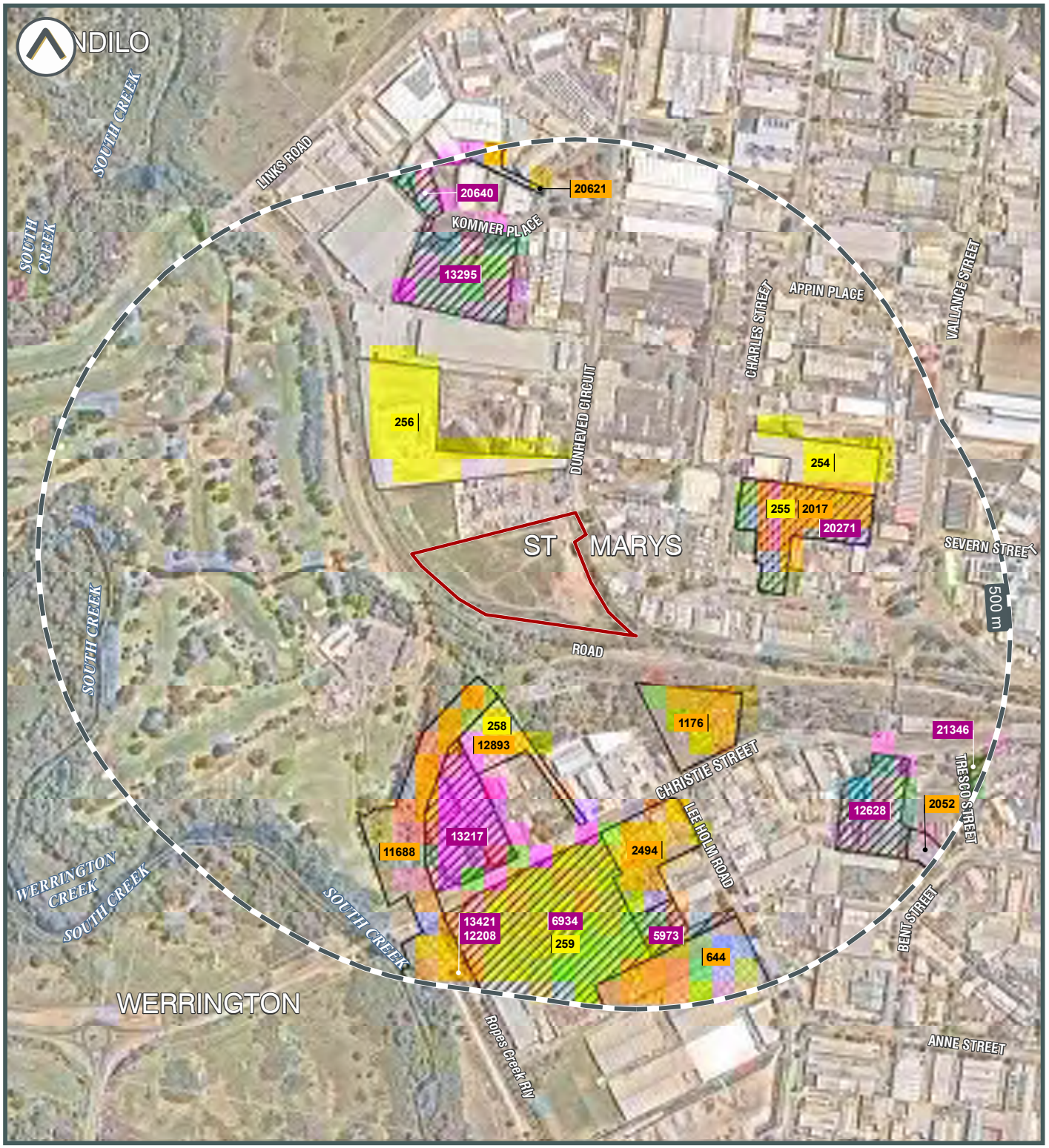
0 200 400 600 800m

Land Insight RESOURCES

ENVIRONMENTAL REGISTER & LICENCES AND NPI FACILITIES

MAP 7

Due Diligence Insight



Subject area

NPI Facilities

POEO Register

POEO licences

Surrendered Licences still Regulated by EPA

Clean Up and Penalty Notices

0 200 400 600 800m

Land Insight RESOURCES

POTENTIALLY CONTAMINATING ACTIVITIES

MAP 8a

Due Diligence Insight

Subject area

- Cattle dip/ saleyards
- Dry cleaners
- Fire Rescue sites
- Gas supplier / terminals
- Liquid fuel depots / terminals
- Mine/quarry
- Petrol stations
- Power stations
- Substation locations
- Telephone exchanges
- Waste management facilities
- Wastewater Treatment Facility

Data is current as when this report was created. However due to the turnover of business locations, some addresses may be former.

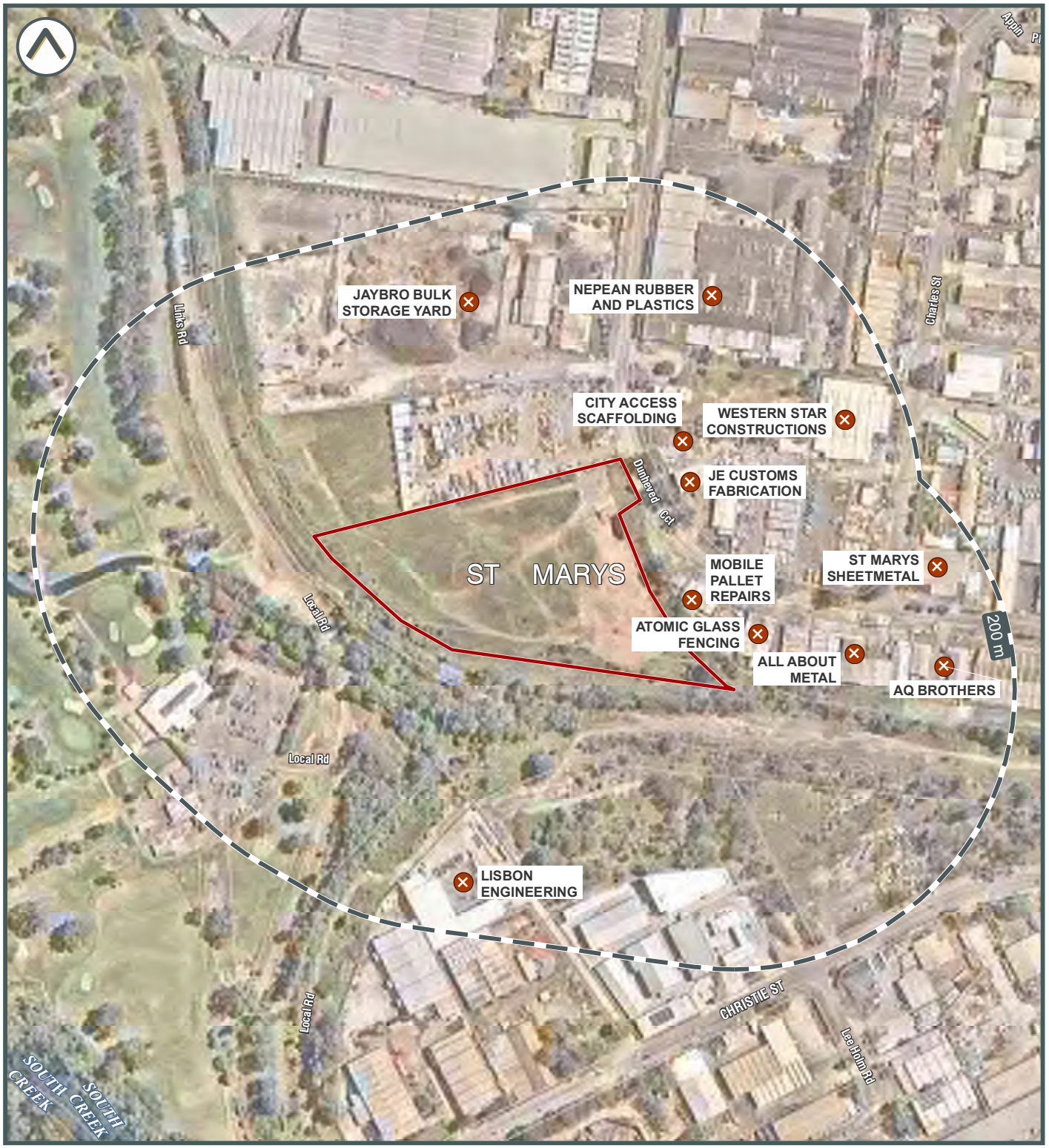
0 200 400 600 800m

Land Insight RESOURCES

CURRENT COMMERCIAL AND TRADE DATA

MAP 8b

Due Diligence Insight



Subject area

Commercial & Trade Directory

- Other potentially contaminating activities
- Former potentially contaminating activities

Tanks

- Aboveground Storage Tank - Current
- Aboveground Storage Tank - Former
- Underground Storage Tank - Current
- Underground Storage Tank - Forrmer/Unknown
- Unknown

*This is not an exhaustive list of all tanks.

0 50 100 150 200 250m

Land Insight RESOURCES

FORMER POTENTIALLY CONTAMINATED LAND

MAP 8c

Due Diligence Insight

Subject area

Contaminated Legacy Areas

Contaminated Legacy Areas
Derelict Mines and Quarries
Historical (Legacy) Landfills

Unexploded Ordnance (UXO) Areas

0 200 400 600 800m

Land Insight RESOURCES

HERITAGE

MAP 9

Due Diligence Insight

Subject area

Federal, State and Local Heritage

- Heritage Area (LEP)
- National Heritage List (NHL)
- Non-Aboriginal heritage item (SHR)
- Commonwealth Heritage List (CHL)
- World Heritage Area (WHA)

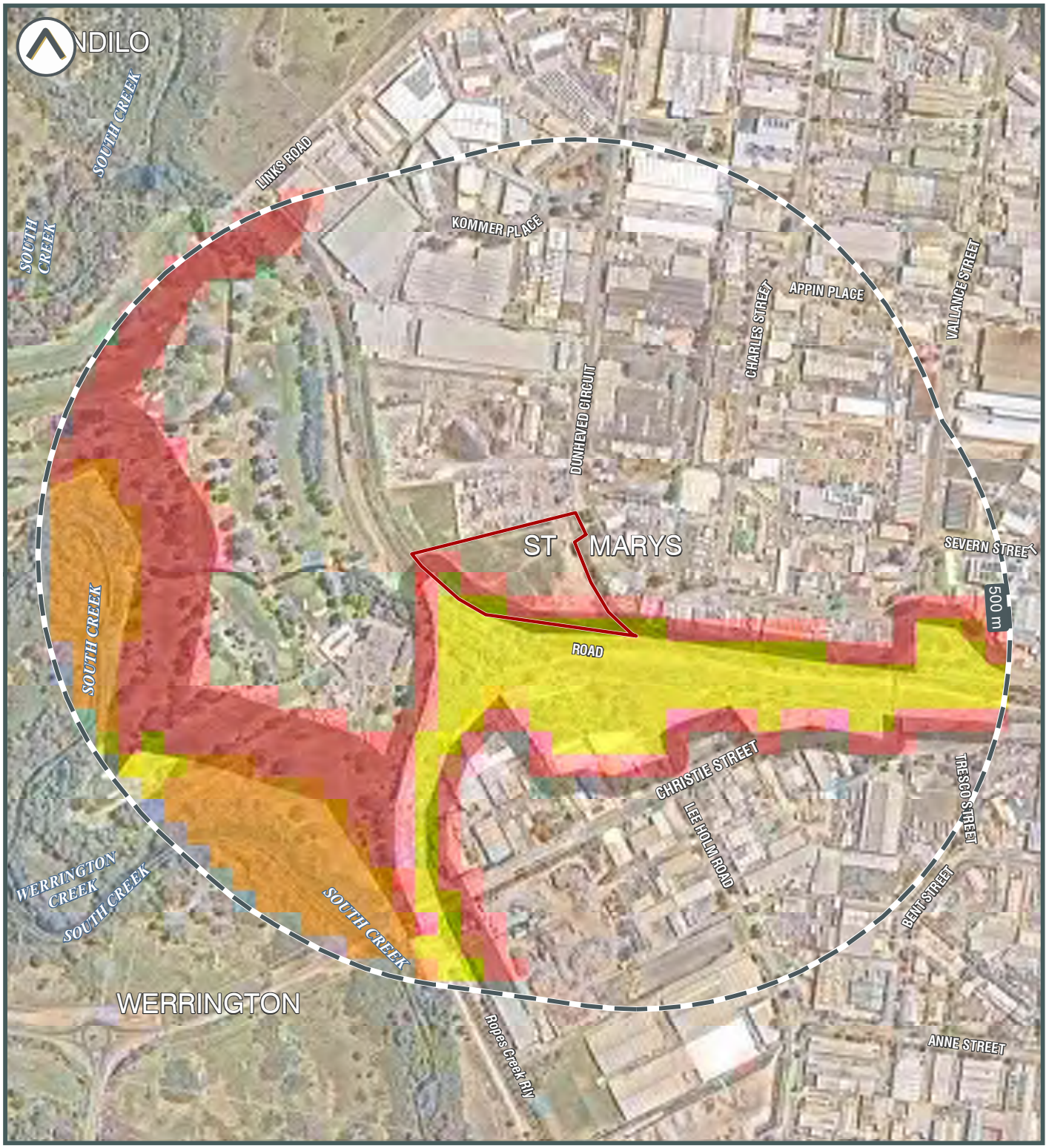
0 50 100 150 200 250m

Land Insight RESOURCES

NATURAL HAZARDS

MAP 10

Due Diligence Insight



Subject area

Flood Hazard

Fire

Bush Fire Prone Land

- Vegetation Buffer
- Vegetation Category 1
- Vegetation Category 2

Coastal Management

0 200 400 600 800m

Land Insight RESOURCES

Land Insight RESOURCES

Appendix B

HISTORIC IMAGERY

HISTORIC AERIAL PHOTOGRAPH - 1947

MAP 11

Due Diligence Insight

LIR-01763 Aerial Photograph 1947 17 03 2021. Data source: Please refer to 'Digital Data Sources' in the Product Guide

Subject area

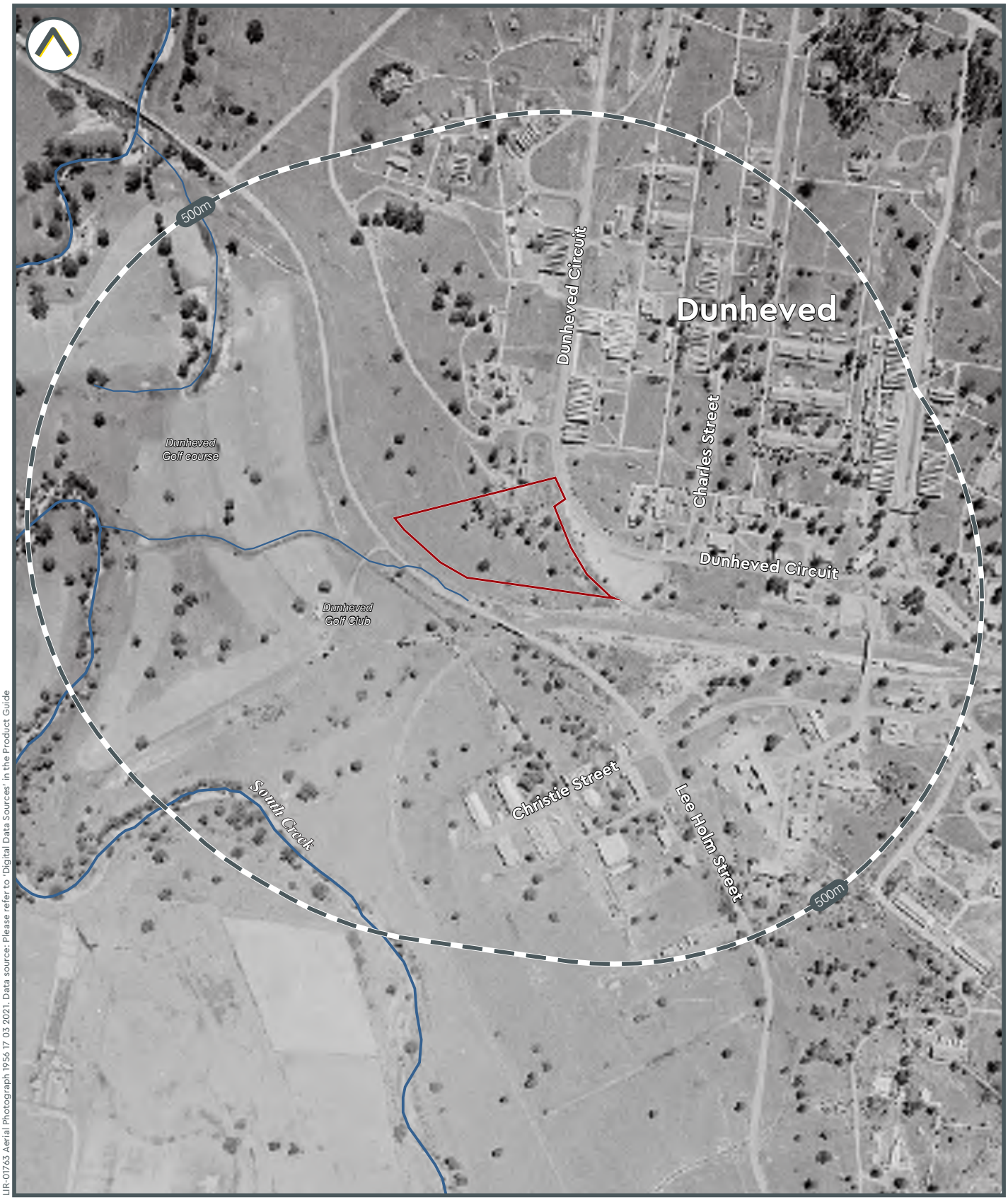
0 200m

Land Insight

HISTORIC AERIAL PHOTOGRAPH - 1956

MAP 12

Due Diligence Insight



LIR-01763 Aerial Photograph 1956 17 03 2021. Data source: Please refer to 'Digital Data Sources' in the Product Guide

Subject area

0 200m

Land Insight

HISTORIC AERIAL PHOTOGRAPH - 1965

MAP 13

Due Diligence Insight

LIR-01763 Aerial Photograph 1965 17 03 2021. Data source: Please refer to 'Digital Data Sources' in the Product Guide

Subject area

0 200m

Land Insight

HISTORIC AERIAL PHOTOGRAPH - 1966

MAP 14

Due Diligence Insight

LIR-01763 Aerial Photograph 1966 17 03 2021. Data source: Please refer to 'Digital Data Sources' in the Product Guide

Subject area

0 200m

Land Insight

HISTORIC AERIAL PHOTOGRAPH - 1970

MAP 15

Due Diligence Insight

LIR-01763 Aerial Photograph 1970 17 03 2021. Data source: Please refer to 'Digital Data Sources' in the Product Guide

Subject area

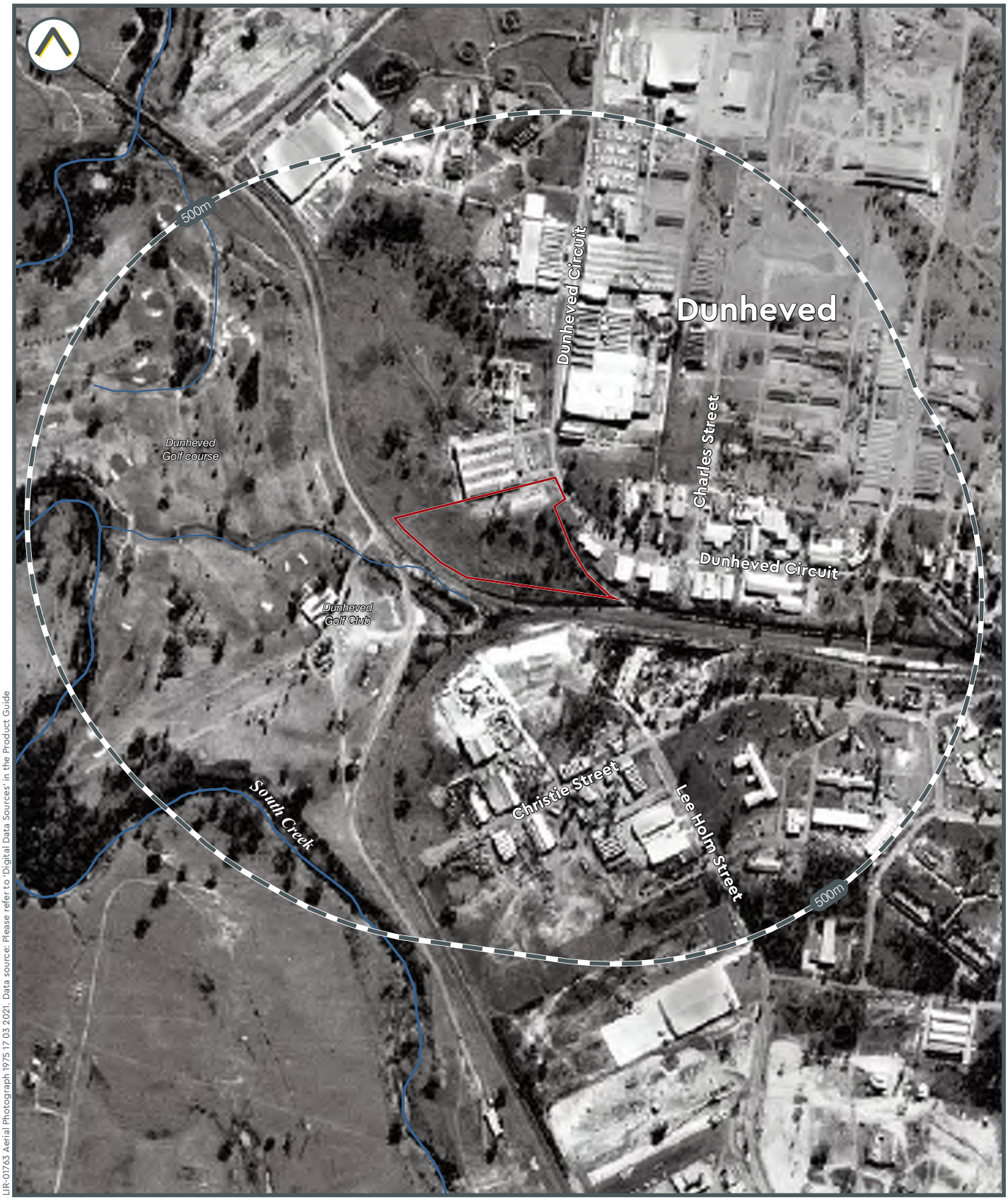
0 200m

Land Insight

HISTORIC AERIAL PHOTOGRAPH - 1975

MAP 16

Due Diligence Insight



LIR-01763 Aerial Photograph 1975 17 03 2021. Data source: Please refer to 'Digital Data Sources' in the Product Guide

Subject area

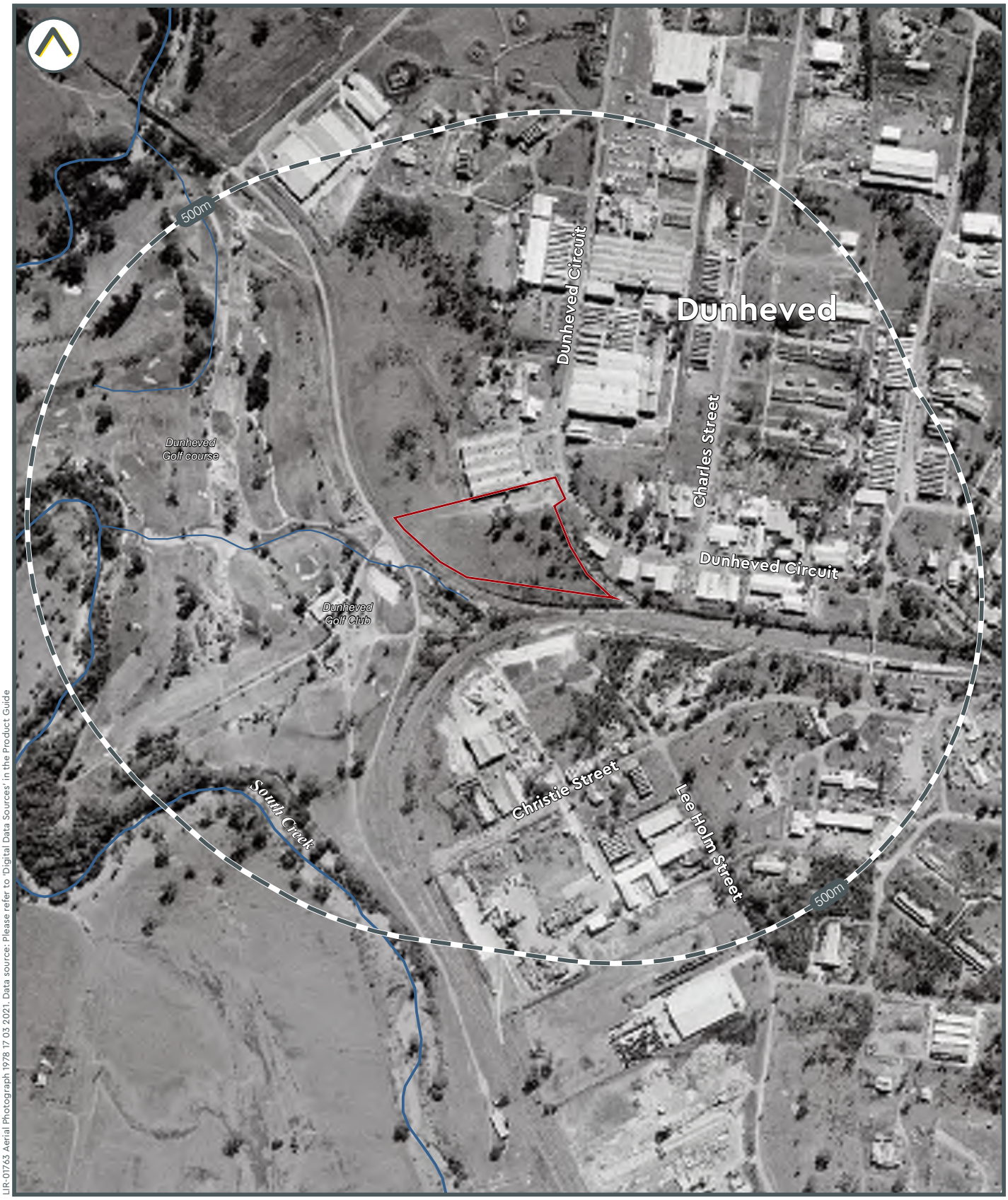
0 200m

Land Insight

HISTORIC AERIAL PHOTOGRAPH - 1978

MAP 17

Due Diligence Insight



LIR-01763 Aerial Photograph 1978 17 03 2021. Data source: Please refer to 'Digital Data Sources' in the Product Guide

Subject area

0 200m

Land Insight

HISTORIC AERIAL PHOTOGRAPH - 1984

MAP 18

Due Diligence Insight

LIR-01763 Aerial Photograph 1978 17 03 2021. Data source: Please refer to 'Digital Data Sources' in the Product Guide

Subject area

0 200m

Land Insight

HISTORIC AERIAL PHOTOGRAPH - 1986

MAP 19

Due Diligence Insight

LIR-01763 Aerial Photograph 1986 17 03 2021. Data source: Please refer to 'Digital Data Sources' in the Product Guide

Subject area

0 200m

Land Insight

HISTORIC AERIAL PHOTOGRAPH - 1991

MAP 20

Due Diligence Insight

LIR-01763 Aerial Photograph 1986 17 03 2021. Data source: Please refer to 'Digital Data Sources' in the Product Guide

Subject area

0 200m

Land Insight

HISTORIC AERIAL PHOTOGRAPH - 1994

MAP 21

Due Diligence Insight

LIR-01763 Aerial Photograph 1986 17 03 2021. Data source: Please refer to 'Digital Data Sources' in the Product Guide

Subject area

0 200m

Land Insight

HISTORIC AERIAL PHOTOGRAPH - 1998

MAP 22

Due Diligence Insight

LIR-01763 Aerial Photograph 1998 17 03 2021. Data source: Please refer to 'Digital Data Sources' in the Product Guide

Subject area

0 200m

Land Insight

HISTORIC AERIAL PHOTOGRAPH - 2002

MAP 23

Due Diligence Insight

LIR-01763 Aerial Photograph 2002 17 03 2021. Data source: Please refer to 'Digital Data Sources' in the Product Guide

Subject area

0 200m

Land Insight

HISTORIC AERIAL PHOTOGRAPH - 2005

MAP 24

Due Diligence Insight

LIR-01763 Aerial Photograph 2005 17 03 2021. Data source: Please refer to 'Digital Data Sources' in the Product Guide

Subject area

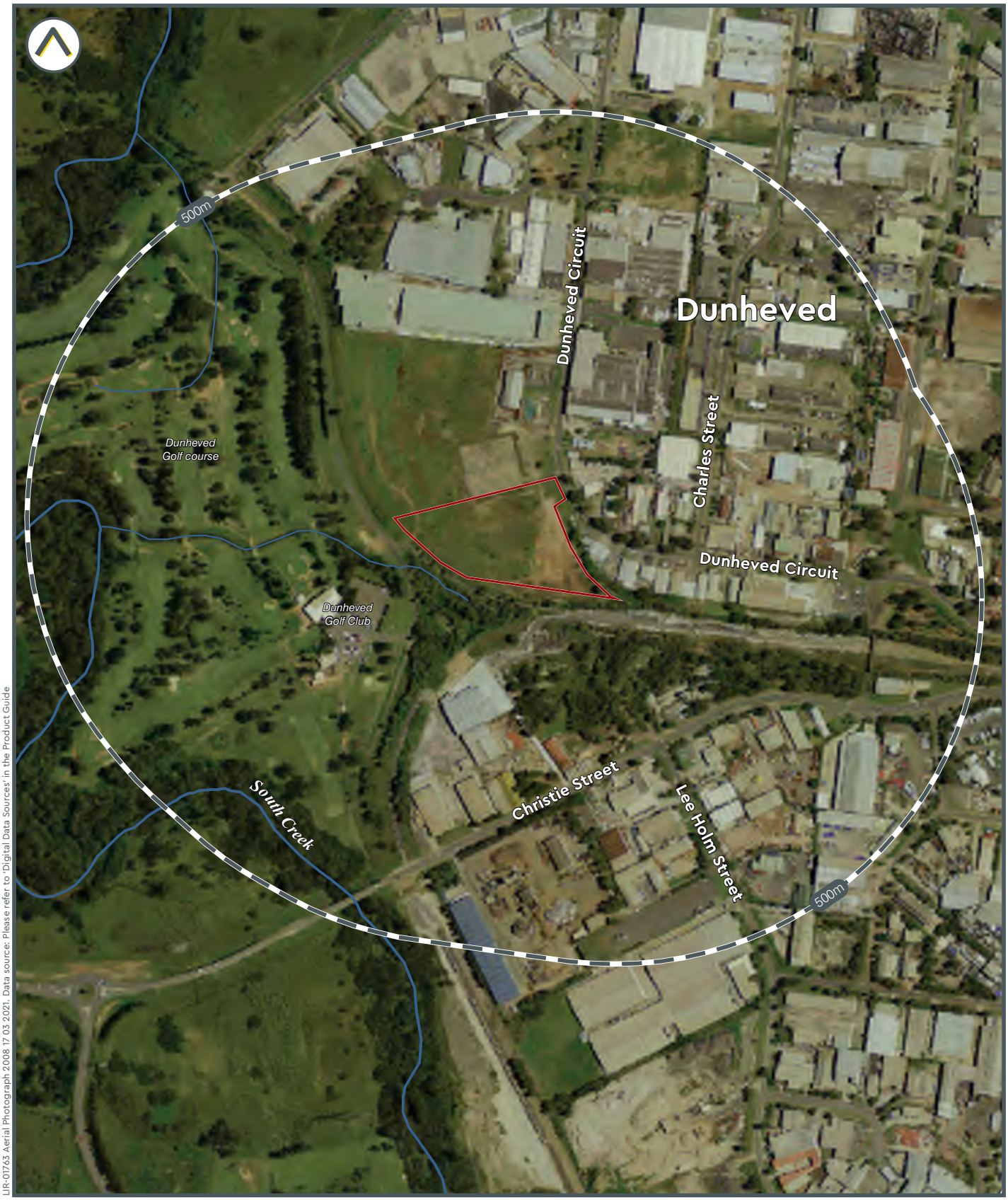
0 200m

Land Insight

HISTORIC AERIAL PHOTOGRAPH - 2008

MAP 25

Due Diligence Insight



LIR-01763 Aerial Photograph 2008 17 03 2021. Data source: Please refer to 'Digital Data Sources' in the Product Guide

Subject area

0 200m

Land Insight

HISTORIC AERIAL PHOTOGRAPH - 2009

MAP 26

Due Diligence Insight

LIR-01763 Aerial Photograph 2008 17 03 2021. Data source: Please refer to 'Digital Data Sources' in the Product Guide

Subject area

0 200m

Land Insight

HISTORIC AERIAL PHOTOGRAPH - 2012

MAP 27

Due Diligence Insight

LIR-01763 Aerial Photograph 2012 17 03 2021. Data source: Please refer to 'Digital Data Sources' in the Product Guide

Subject area

0 200m

Land Insight

HISTORIC AERIAL PHOTOGRAPH - 2015

MAP 28

Due Diligence Insight

LIR-01763 Aerial Photograph 2015 17 03 2021. Data source: Please refer to 'Digital Data Sources' in the Product Guide

Subject area

0 200m

Land Insight

HISTORIC AERIAL PHOTOGRAPH - 2018

MAP 29

Due Diligence Insight

LIR-01763 Aerial Photograph 2018 17 03 2021. Data source: Please refer to 'Digital Data Sources' in the Product Guide

Subject area

0 200m

Land Insight

HISTORIC AERIAL PHOTOGRAPH - 2021

MAP 30

Imagery Insight

LIR-01763 Aerial Photograph 2021 17 03 2021. Data source: Please refer to 'Digital Data Sources' in the Product Guide

Subject area

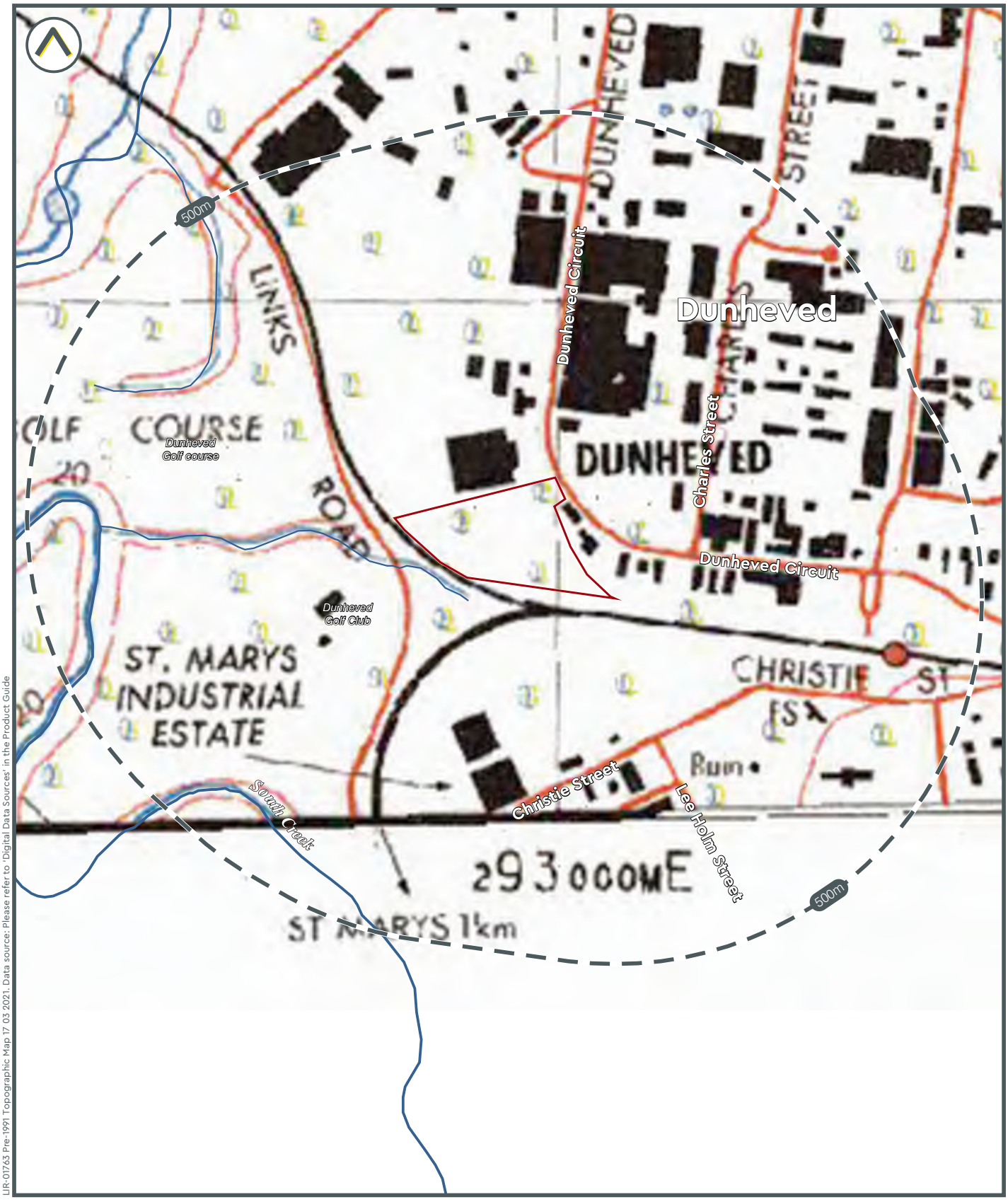
0 200m

Land Insight

1969-1991 1:25,000 TOPOGRAPHIC MAP (RIVERSTONE 9030-1S)

MAP 31

Imagery Insight



LIR-01763 Pre-1991 Topographic Map 17 03 2021. Data source: Please refer to 'Digital Data Sources' in the Product Guide

Subject area

0 200m

Land Insight

Land Insight RESOURCES

APPENDIX J

PHOTO LOG

	PHOTOGRAPHIC LOG (Appendix J)	
Client Name Concrete Estates Pty Ltd C/-EMKC	**Site Location** 2/65 Dunheved Circuit, St Mary's NSW 2760	**Project No.** PS123745

Photo No.	**Date**
1	17/09/20

Description

Eastern boundary – limited filling along the eastern boundary (approximately 0.2m)

Photo No.	**Date**
2	24/02/21

Description

Soil profile of TP07 along the eastern boundary – limited filling (0.2m) with underlying red/grey clay

	PHOTOGRAPHIC LOG (Appendix J)	
Client Name Concrete Estates Pty Ltd C/-EMKC	**Site Location** 2/65 Dunheved Circuit, St Mary's NSW 2760	**Project No.** PS123745

Photo No.	**Date**
3	17/09/20

Description

Southern boundary – dry vegetated travel

Photo No.	**Date**
4	17/09/20

Description

Shale gravels/boulders scattered across the northern section of the site

	PHOTOGRAPHIC LOG (Appendix J)	
Client Name Concrete Estates Pty Ltd C/-EMKC	**Site Location** 2/65 Dunheved Circuit, St Mary's NSW 2760	**Project No.** PS123745

Photo No.	**Date**
5	24/02/21

Description

NEPM visual screening at TP09

Photo No.	**Date**
6	24/02/21

Description

Asbestos fragments identified

	PHOTOGRAPHIC LOG (Appendix J)	
Client Name Concrete Estates Pty Ltd C/-EMKC	**Site Location** 2/65 Dunheved Circuit, St Mary's NSW 2760	**Project No.** PS123745

Photo No.	**Date**
7	24/02/21

Description

TP06 underlying red clay with grey mottling

Photo No.	**Date**
8	24/02/21

Description

TP01 including anthropogenic materials (bricks, tiles, glass). Fill material was identified up to 1.2mBGL.

	PHOTOGRAPHIC LOG (Appendix J)	
Client Name Concrete Estates Pty Ltd C/-EMKC	**Site Location** 2/65 Dunheved Circuit, St Mary's NSW 2760	**Project No.** PS123745

Photo No.	Date
9	24/02/21

Description

Fill material within TP13, anthropogenic inclusions observed to depth (3.0 m BGL)

Photo No.	Date
10	24/02/21

Description

TP13 fill profile

	PHOTOGRAPHIC LOG (Appendix J)	
Client Name Concrete Estates Pty Ltd C/-EMKC	**Site Location** 2/65 Dunheved Circuit, St Mary's NSW 2760	**Project No.** PS123745

Photo No.	**Date**
11	25/02/21

Description
GW01 location

Photo No.	**Date**
12	25/02/21

Description
GW02 location

	PHOTOGRAPHIC LOG (Appendix J)	
Client Name Concrete Estates Pty Ltd C/-EMKC	**Site Location** 2/65 Dunheved Circuit, St Mary's NSW 2760	**Project No.** PS123745

Photo No.	**Date**
13	25/02/21

Description

GW03 location