Aargus

ENVIRONMENTAL - REMEDIATION - GEOTECHNICAL ENGINEERING - WORK HEALTH & SAFETY - LABORATORIES - DRILLING

DETAILED SITE INVESTIGATION

167 Hume Highway, Greenacre NSW

Prepared for

Iris Capital Pty Ltd

9th September 2021

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ABBREVIATIONS

ADWG	Australian Drinking Water Guidelines
ANZECC	Australian and New Zealand Environment and Conservation Council
AST	Aboveground Storage Tank
BGL	Below Ground Level
BTEX	Benzene, Toluene, Ethyl benzene and Xylene
COC	Contaminants of Concern
DLWC	Department of Land & Water Conservation
DNR	Department of Natural Resources
DQOs	Data Quality Objectives
POEO	Protection of the Environment Operations
DSI	Detailed Site Investigation
EPA	Environment Protection Authority
ESA	Environmental Site Assessment
HIL	Health-Based Soil Investigation Level
LGA	Local Government Area
NEHF	National Environmental Health Forum
NEPC	National Environmental Protection Council
NEPM	National Environmental Protection Measure
NHMRC	National Health and Medical Research Council
OCP	Organochlorine Pesticides
OPP	Organophosphate Pesticides
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PID	Photo Ionisation Detector
PQL	Practical Quantitation Limit
PSH	Phase Separated Hydrocarbon
PSI	Preliminary Site Investigation
QA/QC	Quality Assurance / Quality Control
RAC	Remediation Acceptance Criteria
RAP	Site Remediation Plan
RPD	Relative Percentage Difference
SAC	Site Assessment Criteria
SCID	Stored Chemical Information Database
SEPP	State Environment Planning Policy
SMP	Site Management Plan
SVC	Site Validation Criteria
TCLP	Toxicity Characteristics Leaching Procedure
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons
UCL	Upper Confidence Limit
UST	Underground Storage Tank
VOC	Volatile Organic Compounds
VHC	Volatile Halogenated Compounds

EXECUTIVE SUMMARY

Aargus Pty Ltd ('Aargus') was appointed by Iris Capital Pty Ltd (the 'client') to undertake a Detailed Site Investigation ('DSI') within the property located at 167 Hume Highway, Greenacre NSW (the 'site'). It is understood that the site is proposed for the demolition of existing buildings and redevelopment into four buildings for commercial / retail / residential uses including basement car parking and communal open spaces.

At the time of the inspection (31st August 2021), the site was used for commercial purposes and occupied by occupied by a tavern, Chinese restaurant, a warehouse and a motel. The majority of the site is occupied by a sealed bitumen car park.

Land title information provided suggested that the site was originally owned by private individuals until 1986, when the site was then owned by various companies until 2014, when the current owner, Palms (Chullora) Pty Limited purchased the site. Aerial photography indicated that the site land use of the site appeared to have been residential from at least 1943 to 1970 and subsequently re-developed for commercial land use between 1970 and 1991, comprising the features (four buildings and bitumen car park) noted on site at present.

A search of the EPA database revealed that the subject site is not listed. The land is not identified in the Loose-Fill Asbestos Insulation Register as containing loose-fill ceiling insulation. The land is not affected by one of the matters prescribed by Section 59 (2) of the *Contaminated Land Management Act 1997*.

The findings of the assessment indicated the following areas of potential environmental concern, in relation to imported fill of unknown origin, potential pesticide use, leaks of motor vehicles, metal degradation and potential presence of hazardous materials in current or past building structures, which may pose risks to human and environmental receptors.

The soil assessment revealed the following:

- Heavy metals concentrations were below the HIL 'B' and site derived EILs.

- TPH / BTEXN concentrations were below the HSL 'A&B', ESLs and Management Limits.
- PAH, OCP & PCB concentrations were below the HIL 'B', EILs and ESLs.
- Asbestos was not detected in any of the samples analysed.

The groundwater assessment revealed the following:

- Heavy metals concentrations analysed in groundwater (with the exception of arsenic, cadmium, chromium, copper and/or nickel) appeared to fluctuate between meeting or exceeding their respective assessment criteria at various monitoring locations across the site. It was considered that the heavy metals present within the bedrock aquifer were likely to be background concentrations given that no other potential sources of contamination were identified within the immediate vicinity of the site.
- TRH and BTEX concentrations were below the site assessment criteria.
- PAH concentrations were below the site assessment criteria.

Based on the results of this investigation it is considered that the risks to human health and the environment associated with soil and groundwater contamination at the site is negligible within the context of the proposed use of the site for four buildings for commercial / retail / residential uses including basement car parking and communal open spaces development.

The site is therefore considered to be suitable for the proposed use.

Any soils requiring removal from the site, as part of future site works, in particular to those beneath the existing site features, should be classified in accordance with the "*Waste Classification Guidelines, Part 1: Classifying Waste*" NSW EPA (2014).

1 INTRODUCTION

1.1 Background

Aargus Pty Ltd ('Aargus') was appointed by Iris Capital Pty Ltd (the 'client') to undertake a Detailed Site Investigation ('DSI') within the property located at 167 Hume Highway, Greenacre NSW (the 'site'). The location of the property is presented in Figure 1 of Appendix A.

It is understood that the site is proposed for the demolition of existing buildings and redevelopment into four buildings for commercial / retail / residential uses including basement car parking and communal open spaces. The concept plans can be found in Appendix B.

As part of the planning process (Direction 2.6 – Remediation of Contaminated Land), it is a requirement that a site investigation report be prepared by a consultant to assess whether the site is suitable for the proposed development.

1.2 Objective

The primary objectives of this DSI are as follows:

- Identify potential areas where contamination may have occurred from current and historical activities;
- Identify potential contaminants associated with potentially contaminating activities;
- Assess the potential for soils and groundwater to have been impacted by current and historical activities; and
- Assess the suitability of the site for redevelopment into four buildings for commercial / retail / residential uses including basement car parking and communal open spaces based on its current condition and the findings of this investigation.

1.3 Scope of Works

The scope of works for this DSI includes:

- Review of the physical site setting and site conditions based on a site inspection, including research of the location of sewers, drains, holding tanks and pits, spills, patches of discoloured vegetation, etc. (where applicable);
- Research and review of the information available, including previous environmental investigations, current and historical titles information, review of aerial photographs, groundwater bore searches, EPA notices, anecdotal evidence, site survey and site records on waste management practices;
- Development of a preliminary Conceptual Site Model (CSM) to demonstrate the interactions between potential sources of contamination, exposure pathways and human/ecological receptors identified;
- A targeted soil boring/sampling investigative study – formulating and conducting a sampling plan and borehole investigation;
- Groundwater monitoring well installation and groundwater sampling;
- Laboratory analysis and results from sample analysis – findings and comparison to regulatory guidelines;
- Field and laboratory Quality Assurance/Quality Control (QA/QC); and
- Recommendations for additional investigations should any data gaps be identified or possible strategies for the management of the site, where relevant.

This report was prepared with reference to the NSW Environment Protection Authority (EPA) "*Guidelines for Consultants Reporting on Contaminated Sites*" (2020).

2 SITE IDENTIFICATION AND DESCRIPTION

2.1 Site Identification

Site identification information and land use is summarised in the table below.

Table 1: Site Identification

Lot and DP Number (Address)	Lot 402 in DP631754 (167 Hume Highway, Greenacre NSW)
Coordinates (NW corner) *	Latitude: -33.896049, Longitude: 151.051316
Coordinates (NE corner) *	Latitude: -33.89646, Longitude: 151.051745
Coordinates (E corner) *	Latitude: -33.896899, Longitude: 151.051654
Coordinates (SE corner) *	Latitude: -33.897375, Longitude: 151.051115
Coordinates (SW corner) *	Latitude: -33.897092, Longitude: 151.049897
Approx. Site Area (by Survey)	1.175 hectares
Local Government Area	Canterbury-Bankstown
Parish	Bankstown
County	Cumberland
Current Land Zoning**	B6 – Enterprise Corridor
Proposed Land Use	Retail and Medium Density Residential
Current Site Owner	Palms (Chullora) Pty Ltd
Site End Users	Residents (adults & children), visitors, workers

Notes: * refer to http://maps.six.nsw.gov.au/
** refer to https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address

The site boundary and Lot and DP numbers are presented in Figure 2 of Appendix A. A survey plan provided by the client is included in Appendix B.

2.2 Site Inspection

A site visit was carried out on Tuesday 31st August 2021 by an Aargus field engineer to inspect the site for any potential sources of contamination and document any observations made regarding the current site conditions. At the time of the site inspection, the following observations were made:

- The site was irregular in shape and is occupied by a tavern, Chinese restaurant, a warehouse and a motel.
- The majority of the site is occupied by a sealed bitumen car park.
- The tavern is a one and two-storey brick and concrete building with a metal roof and minor landscaping.
- The restaurant is a single-storey brick building with a metal roof and minor landscaping.
- The motel is a two-storey brick building with a metal roof and minor landscaping.
- The warehouse is a single-storey brick and concrete building with a metal roof. The warehouse was utilised an auto repair shop.
- A metal shipping container was observed adjacent to the warehouse.
- The main access to the site was along the Hume Highway along the western boundary.
- There were some open grass covered areas which were observed to be in a healthy condition with no signs of dehydration.
- No surface standing water was noticed at the site.
- No ASTs, USTs and/or chemical storage areas were noted.

The site features are presented in Figure 3 of Appendix A. Site photographs are included in Appendix C.

2.3 Topography and Surface Water Drainage

The following observations were made during the site inspection carried out on Tuesday 31st August 2021:

- The site topography slopes from the Hume Highway in the west towards the south east of the site.
- Stormwater runoff from the site is expected to flow in a south easterly direction.

Copies of the topographical survey provided by the client can be found in Appendix B.

2.4 Surrounding Land Uses

The surrounding land uses identified are described in the table below:

Table 2: Surrounding Land Uses

Orientation	Description
North	Retail and residential
East	Peter Reserve and residential
South	Residential
West	Hume Highway then commercial

3 SITE HISTORY

3.1 Land Titles

A review of historical documents held at the NSW Department of Lands offices was undertaken to identify the current and previous land owners, and potential land uses. The results of the title search are summarised in the following table.

Table 3: Land Title Information

Year	Lot 402 in DP631754 (167 Hume Highway, Greenacre NSW)
2014-2021	Palms (Chullora) Pty Limited
2005-2014	Coles Group Property Developments Ltd
2005	Theo's Liquor Pty Ltd
2003-2005	Pallas Newco Pty Ltd (old name for Theo's)
2000-2003	Karlaun Pty Ltd
1986-2000	Premium Wine Company Pty Ltd
	Prior Title(s): Vol 15061 Fol 54
1983-1986	Cecilia Ellen Wall
	Prior Titles: Vol 4085 Fol 8 / Prior Titles: Vol 5272 Fol 160 / Prior Titles: Vol 5580 Fol 4 / Prior Titles: Vol 5704 Fol 101 / Prior Titles: Vol 5709 Fol 13 / Prior Titles: Vol 6210 Fol 214 / Prior Titles: Vol 8410 Fol 118 / Prior Titles: Vol 9944 Fol 43
1964-1982	John William Wall
1946-1964	William Veil
1928-1946	Henry Smith and Arthur John Smith
1927-1928	Mildred Amelia Smith

In summary, the land title information provided suggested that the site was originally owned by private individuals until 1986, when the site was then owned by various companies until 2014, when the current owner, Palms (Chullora) Pty Limited purchased the site.

A copy of the land titles information obtained by Aargus can be found in Appendix D.

3.2 Aerial Photographs

Selected aerial photographs obtained from the NSW Department of Lands were reviewed to describe the site features and surrounding areas at various timelines. A summary of the review is presented in the table below.

Table 4: Summary of Historical Aerial Photos

Year	Site	Surrounding areas
1943	The site comprised a number of structures that appeared residential in nature along the western boundary. The remainder of the site was open and grassed covered.	N: Residential S: Residential and vacant lands E: Residential and vacant lands W: Road then a large parcel of occupied land
1955	Additional residential dwellings and associated structures were observed.	N: Residential and commercial S: Residential and vacant lands E: Residential and vacant lands W: Road then a building and associated car parking
1970	The majority of the previous structures have all been removed from the site with the exception of one building in the north western portion of the site. The remainder of the site appeared to be stripped of the grass and trees.	N: New commercial buildings S: New low density residential E: New low density residential W: Road then more car parking
1975	A large building is located in the southern and central eastern portion of the site, whilst another building is located in the south western portion. The remainder of the site was vacant.	No apparent changes were observed from the previous photo.
1991	Two new buildings are observed further to those noted in the 1975 photo, those being along the south eastern boundary and the north eastern corner. The remainder of the site was sealed with bitumen.	No apparent changes were observed from the previous photo, with the exception of: N: New commercial building.
1994	The site layout appeared to be similar to that observed in the 1991 photo.	No apparent changes were observed from the previous photo, with the exception of: W: Road then new commercial building.
1998	The site layout appeared to be similar to that observed in the 1994 photo.	No apparent changes were observed from the previous photo, with the exception of:

Year	Site	Surrounding areas
		E: New residential in the southern portion.
2005	The site layout appeared to be similar to that observed in the 1998 photo.	No apparent changes were observed from the previous photo.
2021	The site layout appeared to be similar to that observed in the 2005 photo.	No apparent changes were observed from the previous photo, with the exception of: W: Road then new commercial building.

In summary, land use of the site appeared to have been residential from at least 1943 to 1970 and subsequently re-developed for commercial land use between 1970 and 1991, comprising the features (four buildings and bitumen car park) noted on site at present.

The general land use to the north was initially residential and then redeveloped into a commercial property from the mid 1950s onwards, whilst the land to the west, adjacent to the road, were occupied by various commercial / industrial buildings. The lands to the south and east have predominantly been occupied by residential properties.

Copies of current and historical aerial photographs are presented in Appendix E.

3.3 EPA Records

3.3.1 CLM Act 1997

The NSW EPA publishes records of contaminated sites under Section 58 of the Contaminated Land Management (CLM) Act 1997. The notices relate to investigation and/or remediation of site contamination considered to pose a significant risk of harm under the definition in the CLM Act. However, it should be noted that the EPA record of Notices for Contaminated Land does not provide a record of all contaminated land in NSW.

A search of the EPA database revealed that the subject site is not listed.

There are fifteen (15) properties listed within the Canterbury-Bankstown Local Government Area, which are all greater than 1km from the site, therefore were not considered to pose an adverse impact on the site.

Copies of the EPA records are included in Appendix F.

3.3.2 POEO Register

A search of the POEO Register revealed that the site was not listed. A copy of the POEO register search is included in Appendix F.

3.4 Planning 10.7 Certificates

The Planning 10.7 Certificate – Section 149 (2) of the Environmental Planning & Assessment Act 1979 for the site was obtained by the client and provided to Aargus for review. A summary of the information pertaining to the site is provided below:

- The site is zoned B6 – Enterprise Corridor under the provision of the *Bankstown Local Environmental Plan 2015*.
- Complying Developments under the General Development Code, Subdivision Code, Demolition Code, Fire Safety Code, and Commercial and Industrial (New Buildings and Additions) Code may be carried out.
- Complying Developments under the General Housing Code, Rural Housing Code, Housing Alteration Code, and General Commercial and Industrial Code may not be carried out.
- The land does not include or comprise critical habitat, conservation areas, or environmental heritage items.
- The property is not affected by a road widening or road realignment under the Roads Act.
- The land is not affected by the operation of Section 38 or 39 of the *Coastal Protection Act 1979*.
- The land is not within a proclaimed mine subsidence district.

- The land is not affected by a policy that restricts the development of the land because of bush fire or flooding.
- The land is not identified in the Loose-Fill Asbestos Insulation Register as containing loose-fill ceiling insulation.
- The land is not affected by one of the matters prescribed by Section 59 (2) of the *Contaminated Land Management Act 1997*.

Copies of the certificates are included in Appendix G.

3.5 Industrial Processes and Products Manufactured

A review of the industrial processes and/or products manufactured at the site was conducted, with no such activities noted to have occurred.

3.6 Former Chemical Storage and Transfer Areas

A review of the former chemical storage and transfer areas and/or products manufactured at the site was conducted, with no such activities noted to have occurred.

3.7 Product Spill & Loss History

It was indicated by the client, that to their knowledge no serious land or water contamination had occurred.

The majority of the site is currently either occupied by a building and/ or sealed surfaces. At the time of the inspections, the sealed surfaces were in generally good condition with only minor cracks observed. In addition, there were no visible signs of oil and/or chemical staining, indicating that any surface spills (if they did occur at all) were cleaned up immediately and did not appear to penetrate the existing slab.

3.8 Discharges to Land, Water and Air

No discharge to the land, water and air were observed.

3.9 Complaint History

No complaints were found on internet searches or from discussions with the client.

3.10 Discussion and Summary of Site History

Based on available information, the site historical usage is summarised as follows:

- Land title information provided suggested that the site was originally owned by private individuals until 1986, when the site was then owned by various companies until 2014, when the current owner, Palms (Chullora) Pty Limited purchased the site.
- Aerial photography indicated that the site land use of the site appeared to have been residential from at least 1943 to 1970 and subsequently re-developed for commercial land use between 1970 and 1991, comprising the features (four buildings and bitumen car park) noted on site at present.
- The general land use to the north was initially residential and then redeveloped into a commercial property from the mid 1950s onwards, whilst the land to the west, adjacent to the road, were occupied by various commercial / industrial buildings. The lands to the south and east have predominantly been occupied by residential properties.
- A search of the EPA database revealed that the subject site is not listed.
- The land is not identified in the Loose-Fill Asbestos Insulation Register as containing loose-fill ceiling insulation.
- The land is not affected by one of the matters prescribed by Section 59 (2) of the *Contaminated Land Management Act 1997*.

4 ENVIRONMENTAL SETTING

4.1 Sensitive Environmental Receptors

The nearest down-gradient watercourses are:

- An unnamed tributary is located approximately 300m to the east.
- Coxs Creek is located approximately 2.4km to the south east.
- Cooks River is located approximately 2.4km to the east.
- Cooks River is located approximately 750m to the north west.

4.2 Geology

The Geological Map of Sydney (Geological Series Sheet 9130, Scale 1:100,000, 1983), published by the Department of Mineral Resources indicates the residual soils within the site to be underlain by Triassic Age Shale of the Wianamatta Group, comprising shale, carbonaceous claystone, claystone, laminite, fine to medium grained lithic sandstone and rare coal.

4.3 Acid Sulfate Soils

A review of the NSW Department of Land & Water Conservation (DLWC) *Acid Sulphate Soil Risk Maps* (Edition Two, December 1997, Scale 1:250,000), indicated that site is not located in an ASS risk area.

The NSW ePlanning Spatial Viewer website indicates that the site is not in an area affected by acid sulphate soils (https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address).

4.4 Hydrogeology

Based on available information, our desktop study indicates that the inferred groundwater flow direction would be towards the east, as shown in Figure 6 in Appendix A.

A search of the WaterNSW website borehole database, there were no monitoring wells listed within a 1km radius of the site.

A review of the regional geology and groundwater bore information indicates that the subsurface condition at the site is expected to consist of residual soils overlying relatively shallow bedrock. The occurrence of groundwater that could be utilised as a resource for beneficial use is considered to be relatively low under such conditions. A perched aquifer in the subsurface may be present.

A copy of the groundwater bore search records can be found in Appendix H.

4.5 Summary of Local Meteorology

The monthly rainfall of the local area can be represented by the data collected by Bureau of Meteorology (BOM) from the rainfall gauge located in Canterbury Racecourse, which is located approximately 4.9km east-south-east of the site. Records indicate that the mean annual rainfall since 1995 is 972.5 mm.

Reference can be made to Appendix I – Local Meteorology.

5 AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

Based on the site inspection, site history, previous reports and review of available information from the desktop study, the potential Areas of Environmental Concern (AEC) and their associated Contaminants of Concern (CoC) for the site were identified. These are summarised in the following table.

Table 5: Summary of Potential Areas and Contaminants of Concern

Potential AEC	Potentially contaminating activity	Potential CoCs	Potentially Impacted Medium	Likelihood of Site Impact	Justification
Entire site	Importation of fill material from unknown origin	Metals, TPH, BTEX, PAH, OCP, PCB, Asbestos	Soil	Low	Based on the site observations and site topography, the presence of imported fill material is likely to be minimal.
	Potential for pesticides to have been sprayed or injected on or underneath concrete slabs	OCP		Low	The site is not known for having been used for agricultural purposes from the 1950s when OCPs were first introduced into Australia. If use of OCPs has occurred, the impact is likely to have been localised and limited to the near surface layer.
Carpark and driveways	Leaks from vehicles	Metals, TPH, BTEX, PAH		Low	No major oil staining was observed, and the sealed surfaces were in a good condition.
Metal features	Metal degradation	Metals		Low	If this occurred, the impact would be localised to the near surface soils.
Former Building Structures	Potential Asbestos/Fibro Features	Asbestos		Low	If asbestos features were present in the former building structures, the impact would be localised to the near surface soils.
Current Building Structures	Potential Asbestos/Fibro Features	Asbestos		Low	If present, these will be removed by licensed contractors.

6 DATA QUALITY OBJECTIVES

6.1 Step 1 – State the Problem

6.1.1 Problem Statement

The site is proposed to be developed into four buildings for commercial / retail / residential uses including basement car parking and communal open spaces. As part of the planning process (Direction 2.6 – Remediation of Contaminated Land), it is a requirement that a site investigation report be prepared by a consultant to assess whether the site is suitable for the proposed development.

However, the desktop study identified some areas of potential environmental concern, in relation to imported fill of unknown origin, potential pesticide use, leaks of motor vehicles, metal degradation and potential presence of hazardous materials in current or past building structures, which may pose risks to human and environmental receptors.

6.1.2 Objectives

The objectives of the DSI are:

- To assess the potential for the soils and groundwater to have been impacted by current and historically contaminating activities.
- To assess the suitability of the site for redevelopment into four buildings for commercial / retail / residential uses including basement car parking and communal open spaces as part of Council's requirements for the DA.

6.1.3 Project Team

The nominated core project team and their responsibilities are listed in the table below.

Table 6: Project Team and Responsibilities

Project Team Member	Responsibilities
Mark Kelly – Principal Environmental Consultant	Project Manager and Technical Review
Nick Kariotoglou – Principal Environmental Scientist	Project Director and Field Representative
Saad Bin Suleman – Environmental Engineer	Field Representative and Report Author

6.1.4 Preliminary Conceptual Site Model

The preliminary CSM, based on the PSI, is summarised in the table below.

Table 7: Conceptual Site Model

Potential Sources	Potential Receptor	Potential Exposure Pathways	Complete Linkages	Risk	Justification
Fill materials Car parking Pesticide use Metal degradation	Site users or the general public	Dermal contact, inhalation or ingestion of exposed impacted soils	Limited (Current)	Low	The site surfaces are predominantly sealed.
			No (Future)	Negligible	If present, contaminated soils are likely to be remediated and removed for off-site disposal.
	The aquatic ecosystems at the nearby creeks	Migration of impacted groundwater and surface water run-off	Yes (Current)	Low	No obvious sources of contamination were observed on site that could migrate off site with surface water run-off.
			No (Future)	Negligible	Any sources of contamination will be removed.
	Underlying Aquifer	Leaching and migration of contaminants through groundwater infiltration	Limited (Current)	Low	Due to the depth to groundwater as well as the permeability of the soil profile, leachability of metals and other inorganics vertical migration of contaminants is likely to be limited.
			No (Future)	Negligible	If present, contaminated soils are likely to be remediated.

Potential Sources	Potential Receptor	Potential Exposure Pathways	Complete Linkages	Risk	Justification
Asbestos in current/former buildings	Site user or visitors	Inhalation of airborne fibres	Limited (Current)	Low	If present, they are likely to be in a bonded form.
			No (Future)	Negligible	If present, contaminated soils are likely to be remediated.

6.2 Step 2 - Identify the Decisions of the Study

The decisions required to address the contamination problem are as follows:

- Is soil and groundwater contamination present within the areas of potential environmental concern identified?
- Is soil and groundwater contamination likely to present an unacceptable risk of harm to humans or the terrestrial and aquatic environments?
- Is the site currently suitable for the proposed land use being residential with minimal access to soil?
- Is there a potential for onsite/offsite migration issues?
- If not, does the site require further investigation and/or remediation works?

6.3 Step 3 - Identify Information Inputs

The following information is required for input into the decisions identified in Step 2:

- Identification of potential areas and contaminants of concern as detailed in Section 5 of this report;
- Selection of soil and groundwater assessment criteria from appropriate guidelines as detailed in Section 8 of this report;
- Collection of soil and groundwater samples from site;
- Headspace analysis for screening of VOCs present within soils using a PID;
- Measurement of groundwater quality parameters including pH, temperature, redox potential, electrical conductivity and dissolved oxygen; and
- Comparison and interpretation of results again the adopted soil and groundwater assessment criteria.

6.4 Step 4 – Define the Study Boundaries

The spatial and temporal aspects of the investigation area that the data must represent to support the decisions identified in Step 2 are as follows:

- The lateral extent of the study boundary is defined by the site boundaries as shown in the Site Location Plans (refer to Figure 1).
- The vertical extent of the study boundary is defined by the depth of the natural soils in all boreholes located at approximately 0.4 metres below the ground surface.
- The vertical extent of the study boundary is defined by the depth of the water table located at approximately 5.07 metres below the ground surface.

6.5 Step 5 – Develop the Analytical Approach

The acceptable limits for laboratory QA/QC parameters are shown in the table below and are based upon the laboratory reported acceptable limits and those stated within the NEPM 2013 Guidelines.

Table 8: Acceptable Limits for QC Samples

Type of QC Sample	Control Limit
FIELD	
Rinsate Blanks	Analytes <LOR
Intra-Laboratory Duplicates	RPD's <50%
Inter-Laboratory Duplicates	RPD's <50%
Trip Blanks	Volatiles <LOR
Trip Spike Recovery	>70%
LABORATORY	
Method Blanks	< Laboratory LOR
Matrix Spike	Recovery targets: • Metals: 70% to 130% • Organics: 60% to 140%
Laboratory Duplicate	RPD's <30%
Laboratory Control Samples	Recovery targets: 60% to 140%
Surrogate Spike	Recovery targets: 60% to 140%

The following conditions should be adopted:

- If the control limits are exceeded, then an assessment of the significance of the results should be carried out;
- If the results of the DQI assessment indicate that the data set is reliable, then the data set will be deemed to be acceptable for the purposes of the investigation; and
- If the measured concentrations of soil and groundwater samples analysed meet their respective validation criteria, then no additional assessment is required is required.

6.6 Step 6 - Specify Limits on Decision Errors

There are two types of decision errors:

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

These errors may lead to following (null hypothesis):

- Deciding that the site is not suitable for the proposed development when it actually is (Type I error);
- Deciding that the site is suitable for the proposed development when it is actually not (Type II error);
- Deciding that the risks to human health from soil vapour concentrations are high and require further management or remediation, when the risks are actually low (Type I error); and
- Deciding that the risks to human health from soil vapour concentrations are low and requires no further management, when the risks are actually high (Type II error).

A 5% significance level has been selected for Type I errors on the basis that 95% of the data set will satisfy the DQIs. Therefore, the acceptable limit of the decision errors is based on a 5% probability of the hypothesis being incorrect.

An assessment will be made as to the likelihood of a decision error being made based on:

- The acceptable limits for inter/intra laboratory duplicate sample comparisons as specified in Step 5 of the DQOs; and
- The acceptable limits for laboratory QA/QC parameters are based upon the laboratory reported acceptable limits and those stated within the NEPM Guidelines.

If the concentration of a particular contaminant of concern exceeds its assessment criteria, then a further assessment is required to address the significance of the result. Statistical analysis based on 95% UCL may be used to assess the significance of the data provided the following conditions are met:

- the arithmetic mean of the data set must be less than its respective threshold level; that is, it is acceptable for individual results to exceed its respective threshold level, but the cumulative mean of the data set of soil sample results must not exceed the threshold level;
- the standard deviation of the data set is less than 50% of the relevant threshold level; and
- no individual sample result should be greater than 250% of the relevant threshold level.

Ecological data is not included in this assessment process as ecological results cannot be statistically interpreted.

6.7 Step 7 - Optimise the Design for Obtaining Data

The optimum design for obtaining data in order to achieve the Data Quality Objectives is as follows:

- Only NATA-accredited environmental testing laboratories will be commissioned to analyse soil and groundwater samples and will implement a quality control plan conforming to the NEPM (Assessment of Site Contamination) Measure Schedule B(3) Guidelines for Analysis of Potentially Contaminated Soils;
- An assessment of the Data Quality Indicators to determine if the field procedures and laboratory analytical results are reliable;
- The investigation will be carried out by an experienced and qualified Environmental Scientist, who is trained in sampling at contaminated sites in accordance with Aargus protocols based on best practice industry standards;
- Collection of QA/QC samples at frequencies prescribed in the NEPM Guidelines; and
- In accordance with the NSW EPA "Sampling Design Guidelines" (September 1995) a minimum of twenty-three (23) sampling points for a site area of 1.175 hectares will be adopted to provide general site coverage.

7 DATA QUALITY INDICATORS

7.1 General

The five Data Quality Indicators (DQIs) comprising completeness; comparability; representativeness; precision and accuracy provide an assessment of the reliability of field procedures and laboratory analytical results in accordance with the NEPM 2013 Schedule B2 Guidelines on Site Characterisation, Appendix C – Assessment of data quality. These are addressed in the following sub-sections.

7.2 Completeness

Data Completeness is a measure of the amount of useable data (expressed as %) from a data collection activity. The completeness is equal to the percentage of valid quality assurance and quality control results.

The assessment should address the following:

Table 9: Data Completeness

Field	Laboratory
• All critical locations are sampled; • All samples collected from critical grids and depths; • Consistency in the use of standard operating procedures, equipment, sampler; • Completion and correctness of field documentation.	• All critical samples and analytes are analysed in accordance with the DQOs; • Appropriateness of laboratory methods and PQLs.

The minimum target frequency for each type of QA/QC sample should be carried out in accordance with the following table:

Table 10: QA/QC Requirements

Field QA/QC Sample	Frequency (Soil / Groundwater)
Intra-Laboratory Duplicate	1 in 20 samples
Inter-Laboratory Duplicate	1 in 20 samples
Field Blanks	1 per day (rinsate)
Trip Blank	1 per sample batch
Trip Spike	1 per sample batch

Where any of the above objectives are not achieved for particular samples, steps will be taken to rectify the non-conformance, if possible. Alternatively, data qualifiers detailing the nature of the quality problem will be documented in the report and attached to relevant data in the result summary tables.

The target for overall completeness for each data set is a minimum of 95%. A data completeness of less than 95% may be accepted where it can be justified that the non-conformance does not have a significant effect on the outcome of the results.

7.3 Comparability

Data Comparability is the confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event.

The qualitative assessment should address the following:

Table 11: Data Comparability

Field	Laboratory
• Consistency in the use of standard operating procedures, equipment, sampler • Consistency in the method of sample collection for each media • Quantification of influence by climatic conditions	• Consistency of analytical methods and limits of reporting (LOR) for each analyte • Whether laboratory limits of reporting are set at < 20% of the adopted site criteria value for each analyte • Consistent use of one primary and one secondary laboratory

7.4 Representativeness

Data Representativeness is the confidence (expressed qualitatively) that data are representative of each media present on the site.

The qualitative assessment should address the following:

Table 12: Data Representativeness

Field	Laboratory
• Samples are collected in accordance with the DQOs • Receipt of samples within holding times • Receipt of intact samples • Receipt of adequately preserved samples	• All samples are extracted and analysed within their respective holding times

7.5 Precision

Data Precision is a quantitative measure of the variability (or reproducibility) of data.

Intra-laboratory or Inter-laboratory Duplicate Samples (B) results are compared with Primary Sample (A) results using Relative Percentage Differences (RPDs) according to the following formula:

$$\%RPD = \left| \frac{A - B}{A + B} \right| \times 200$$

Duplicate sampling rates for this assessment (**for each separate sample batch**) are to be tested for all the same analytes as the primary sample:

Table 13: Data Precision

Type of QC Sample	Control Limit
Field Intra-Laboratory Duplicate (Blind)	RPD < +/- 50%
Field Inter-Laboratory Duplicate (Split)	RPD < +/- 50%

Where the laboratory has reported results for a particular analyte below the limit of reporting for either the primary sample or a duplicate sample, the RPD is reported as 'Not Calculable' or NC. A discussion should be made as to which sample should be adopted and compared against the relevant assessment criteria. However, no discussion is required where both the primary sample and the duplicate sample for a particular analyte are below the limit of reporting.

7.6 Accuracy

Data Accuracy is a quantitative measure of the closeness of reported data to the true value. Laboratory measured recovery of analytes in lab control samples with known concentrations. Laboratory QA/QC testing is to include:

Table 14: Data Accuracy

Laboratory QA/QC Sample	Frequency
Method Blank	1 per 20 samples
Matrix Spike	1 per 20 samples
Laboratory Duplicate	Laboratory defined
Laboratory Control	Laboratory defined
Surrogate Spike	All organic samples

8 SITE INVESTIGATION AND SCREENING LEVELS

8.1 General

The selection of appropriate human health, ecological and groundwater site assessment criteria were based on the following guiding documents:

- "Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000" (ANZECC);
- "Australian Drinking Water Guidelines 2011" (ADWG);
- "Guidelines for Managing Risk to Recreational Waters 2008 (GMRRW); and
- "National Environmental Protection (Assessment of Site Contamination) Amendment Measure 2013 (No.1)", NEPC (2013).

Full details of the site investigation and screening levels for each potential contaminant of concern in soils and groundwater identified in Section 5 are presented in Appendix J.

8.2 Soils Investigation and Screening Levels

8.2.1 Health Investigation Levels (HILs)

The NEPM presents Tier 1 Health Investigation Levels (HILs) for a broad range of chemicals such as metals, inorganics, PAHs, phenols, pesticides and other organics. The HILs are applicable to generic land uses such as residential, commercial/industrial or public open space and all soil types, generally within the first 3 metres of soil below ground level. The HILs have been applied to assess human health risks via all relevant pathways of exposure.

Based on the proposed development, soil investigation results within the site will be assessed against the **HIL 'B' –** *Residential with minimal opportunities for soil access; includes dwellings with fully and permanently paved yard space such as high-rise buildings and apartments.*

8.2.2 Health Screening Levels (HSLs)

The NEPM presents Tier 1 Health Screening Levels (HSLs) for the following petroleum compounds and fractions:

- Benzene, Toluene, Ethylbenzene and Xylenes (BTEX);
- Naphthalene; and
- TPH C6-C10 and TPH >C10-C16 fractions

The HSLs are applicable to generic land uses such as residential, commercial/industrial or recreational/public open space and different soil types between the ground surface and soils >4 metres below ground level. The HILs have been applied to assess human health risks via the inhalation and direct contact pathways of exposure.

Based on the proposed development, soil investigation results within the site will be assessed against the HSL "A & B".

8.2.3 Ecological Investigation Levels (EILs)

The NEPM presents Ecological Investigation Levels (Interim EILs) for As, Cu, CrIII, Ni, Pb, Zn, DDT and naphthalene.

The EILs are applicable to generic land uses such as areas of ecological significance, urban residential areas and public open space, and commercial/industrial land uses. The EILs have been applied to assess risks to terrestrial ecosystems, generally, within the top 2 metres of soil at the final surface/ground level.

Site specific EILs for Copper, Zinc, Nickel and Chromium III can be derived by adding the Ambient Background Concentration (ABC) to the Added Contaminant Limits (ACL), as per the following formula $EIL = ABC + ACL$.

The ABC of a contaminant is the soil concentration in a specified locality that is the sum of the naturally occurring background level and the contaminant levels that have been introduced from diffuse or non-point sources by generating anthropogenic activity not attributed to industrial, commercial, or agricultural activities.

The ACL is the added concentration (above the ABC) of a contaminant above which further appropriate investigation and evaluation of the impact on ecological values is required. ACLs are based on the soil characteristics of pH, CEC and clay content. Different soils types / profiles will have different contaminant EILs rather than a single generic EIL for each contaminant. ACLs apply chromium III (CrIII), copper (Cu), nickel (Ni) and zinc (Zn) for site-specific EIL determination. The soil properties to be measured for site-specific derivation of ACLs for CrIII, Cu, Ni and Zn are summarised below:

- pH - Cu
- CEC - Cu, Ni, Zn
- % clay - CrIII

Note – the lowest concentration of copper that is derived from the pH or the CEC calculation is to be used for the ACL.

Insufficient data was available to derive ACLs for As, Pb, DDT and naphthalene. As a result, the derived EILs are generic to all soils and are presented as total soil contaminant concentrations in Tables 1(B)4 and 1(B)5.

8.2.4 Ecological Screening Levels (ESLs)

Table 1B (6) of the NEPM presents Ecological Screening Levels (ESLs) for TPH C6-C40 fractions, BTEX and benzo(a)pyrene.

The ESLs are applicable to generic land uses such as areas of ecological significance, urban residential areas and public open space, and commercial/industrial land uses. The ESLs have been applied to assess risks to terrestrial ecosystems, generally, within the top 2 metres of coarse or fine soil at the final surface/ground level.

8.2.5 Petroleum Hydrocarbon Management Limits

Table 1B (7) of the NEPM presents petroleum hydrocarbon management limits for application to TPH fractions C_6-C_{10}, >C_{10}-C_{16}, >C_{16}-C_{34} and >C_{34}-C_{40}. The management limits are applicable for coarse or fine soils in residential, parkland, public open space or commercial/industrial land uses following consideration of relevant ESLs and HSLs.

Based on the proposed development, soil investigation results within the site will be assessed against the 'Residential, parkland and public open space'.

8.2.6 Asbestos

Health screening for asbestos in soil, which are based on scenario-specific likely exposure levels, are adopted from the WA DoH guidelines and are referred in Table 7 in Schedule B1.

Table 15 Health screening levels for asbestos contamination in soil

	Health Screening Level (w/w)			
Form of asbestos	**Residential A[1]**	**Residential B[2]**	**Recreational C[3]**	**Commercial/ Industrial D[4]**
Bonded ACM	0.01%	0.04%	0.02%	0.05%
FA and AF[5] (friable asbestos)	0.001%			
All forms of asbestos	No visible asbestos for surface soil			

1. Residential A with garden/accessible soil also includes children's day care centres, preschools and primary schools.
2. Residential B with minimal opportunities for soil access; includes dwellings with fully and permanently paved yard space such as high-rise buildings and apartments.

3. Recreational C includes public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and unpaved footpaths.
4. Commercial/industrial D includes premises such as shops, offices, factories and industrial sites.
5. The screening level of 0.001% w/w asbestos in soil for FA and AF (i.e. non-bonded/friable asbestos) only applies where the FA and AF are able to be quantified by gravimetric procedures (refer Section 4.10). This screening level is not applicable to free fibres.

8.3 Groundwater Investigation and Screening Levels

8.3.1 Potential Beneficial Uses

Groundwater investigation and screening levels were established by identifying the potential beneficial uses of groundwater down-gradient from the site based on the Six Environmental Values presented in the table below.

Table 16: Potential Beneficial Uses of Groundwater

Environmental Value	Applicability
Freshwater aquatic ecosystem	✓
Marine aquatic ecosystem	×
Agricultural use - irrigation	×
Agricultural use – stock watering	×
Recreational use	✓
Raw drinking water	×

The applicable Environmental Values were selected on the basis of the following down-gradient receptors as identified in Section 4.1 of this report:

- Recreational users and aesthetics at Cooks River.
- The marine water aquatic ecosystem at Cooks River.

No abstraction wells for agricultural use were identified within 1 km of the site.

For each relevant Environmental Value identified above, the groundwater investigation and screening levels adopted are discussed in the following sub-sections. Full details of the investigation and screening levels for potential contaminants of concern in groundwater are presented in Appendix J.

If the screening or investigation levels are exceeded, then further consideration will be given to processes such natural attenuation, advection, adsorption and contaminant flux to assess potential risks to down-gradient aquatic ecosystems or drinking water sources.

8.3.2 Protection of Aquatic Ecosystems

Table 1C of the NEPM presents Groundwater Investigation Levels (GILs) for the protection of fresh water and marine water in slightly to moderately disturbed ecosystems. However, where the closest sensitive receptor is high value or highly disturbed, Section 3.1 of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000) provides a range of water quality guidelines values based upon three levels of ecosystem conditions as shown in the table below.

Table 17: Aquatic Ecosystem Values

Ecosystem Value	Protection Level	Brief Definition	Applicability
High conservation or ecological value systems	99%	Effectively unmodified, with ecological integrity regarded as intact.	×
Slightly to moderately disturbed ecosystems	95% or 99% for highly bioaccumulating toxicants	Small impacts to aquatic biological diversity within moderately cleared catchments with reasonably intact riparian vegetation.	✓
Highly disturbed ecosystems	90% or 80%	Measurably degraded ecosystems typically associated with shipping ports or urban catchments.	×

Based on observations made during the site walkover, the aquatic ecosystem value of the Cooks River area was considered to be slightly to moderately disturbed and that the NEPM GILs are applicable.

However, where contaminants are potentially bio-accumulative, trigger values for the protection of 99% of species were used. Low reliability trigger values presented in Table 3.4.1 of the ANZECC 2018 guidelines were also adopted in the absence of high or moderate reliability trigger values.

8.3.3 Recreational Water Use and Aesthetics

The GMRRW guidelines (as referenced in NEPM) recommend adopting a multiplication factor of 10 to 20 to the ADWG for the assessment of recreational water quality. This is based on the rationale that the ADWG guideline values are based on a daily consumption of 2L, which is considered to be very conservative for application to recreational water exposure. On this basis, a multiplication factor of '10' (i.e. recreational consumption of 200mL per day) will be applied to the ADWG health guidelines to establish screening criteria.

8.3.4 Groundwater Health Screenings Levels for Vapour Intrusion

Table 1A(4) of the NEPM presents Groundwater Health Screening Levels (HSLs) for vapour intrusion. The HSLs are applicable to generic land uses such as residential, commercial/industrial or recreational/public open space and different soil types between 2m and >4 metres below ground level. The HSLs have been applied to assess human health risks via the inhalation pathway of exposure.

If site conditions are conducive to biodegradation, the following factors will be applied to the HSLs:

- Factor of x10 for depths to source of 2 to <4m; and
- Factor of x100 for depths to source of 4m and greater where the vapour source strength is 100 mg/L (100,000 mg/m^3) or less.

For groundwater concentrations exceeding their respective solubility limits in Table 1A(4) of Schedule B1 of the NEPM, it is considered that the soil vapour concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario and is denoted as 'NL' (not limiting).

8.4 Export of Waste

To assess the waste classification of materials to be disposed of off-site, the NSW EPA refers to the NSW EPA (2014) "*Waste Classification Guidelines, Part 1: Classifying Waste"*.

9 SOIL INVESTIGATION

9.1 General Methodology

The soil investigation was carried out on Tuesday 31st August 2021 and was designed to meet the Data Quality Objectives. The fieldwork procedures adopted were carried out in general accordance with the Aargus fieldwork protocols, which are based on industry standard practice as prescribed in the NEPM.

Prior to the commencement of the intrusive investigation, a Dial-Before-You-Dig (DBYD) search was carried out and a professional services locator was engaged to clear the proposed sampling locations for underground services.

Upon clearance of the proposed sampling locations, concrete surfaces at each borehole location (where present) were cored by using a 200mm diameter diatube. The first 1.2m depth at each sampling location was dug using hand tools to confirm the absence of underground services prior to drilling.

Each borehole was drilled using hollow flight augers attached to a truck-mounted drill rig.

The boreholes were backfilled with clean spoil or clean sand/gravel. Where a semi-confined or confined layer was encountered, a bentonite seal was used to prevent potential cross-contamination between the overlying and underlying strata.

9.2 Sampling Design Rationale

Twenty-three boreholes (BH1 to BH23) were drilled by adopting a systematic grid sampling pattern across the site to provide general site coverage with consideration given to accessibility and site features.

It is considered that the number of sampling points adopted meets the minimum requirements of the NSW EPA "Sampling Design Guidelines" (1995) for a site area of 1.175 hectares and to detect a hotspot diameter of 25.7. The borehole locations are shown in Figure 4 of Appendix A.

9.3 Sampling Density and Sampling Depth

Boreholes were advanced through topsoil / fill material and terminated at least 0.5m into natural soils to allow for the collection of at least one soil sample from fill material and one from natural soils. However, a maximum target depth of 9 metres was adopted in borehole locations where groundwater wells were to be installed.

9.4 Sampling Methodology

Soil sampling was carried out in general accordance with Aargus Fieldwork Protocols. In summary:

- Soil samples were collected directly from the drilling augers from each soil type or change in lithology and approximately every 1 metre depth where no change in material was apparent.
- Samples were transferred into clean laboratory supplied containers using a hand trowel.
- In general, each soil sample was divided into two sub-samples. One of the sub-samples was placed into a laboratory-supplied container and a second sub-sample was placed in a separate zip-lock bag for field headspace screening using a PID.

Sampling of asbestos was undertaken as follows:

- One wetted 500ml sample from each sampling location was submitted for laboratory analysis for AF.

9.5 Field Tests

A calibrated Photo-ionisation Detector (PID) meter was used to obtain the following field measurements:

- Background concentrations of ionisable volatile organic compounds (VOCs) in the ambient air taken approximately 5 to 10 metres upwind of the general work area; and
- Headspace analysis of bagged soil samples collected to detect the presence of ionisable VOCs.

The PID readings were observed before and after each measurement of a sample to ensure that the PID was operating correctly. The procedures followed in performing field headspace on soil samples can be found in the Aargus Field Protocols.

Readings of PID maximums, fluctuations and general comments of observation were recorded in Aargus field record forms included in Appendix L. The PID calibration certificate can be found in Appendix L.

9.6 Soil Laboratory Analysis

Soil samples were submitted to their respective laboratories as specified in Section 11.2. The schedules of analysis for each sampling batch are presented in Appendix O.

10 GROUNDWATER INVESTIGATION

10.1 General Methodology

The groundwater investigation was carried out on the 2nd September 2021. Groundwater gauging, purging and sampling methodology adopted was carried out in accordance with Aargus fieldwork protocols.

Groundwater-related field record forms included in Appendix L.

10.2 Sampling Design Rationale

Four (4) of the boreholes drilled were converted into groundwater monitoring wells on the 2nd September 2021 and were designated as GW1 (BH1), GW2 (BH4), GW4 (BH21) & GW5 (BH8). The locations of the monitoring wells are shown on Figure 4 of Appendix A and were selected on the following basis:

- To provide an assessment groundwater conditions within the site.
- Establish groundwater flow direction.

A list of the proposed groundwater monitoring wells and their function in the monitoring network are presented in the table below.

Table 18: Groundwater Network

Well ID	Status	Function
GW1	Installed on the 31.08.2021	Down-gradient well and general monitoring
GW2	Installed on the 31.08.2021	Up-gradient well and general monitoring
GW4	Installed on the 31.08.2021	Down-gradient well and general monitoring
GW5	Installed on the 31.08.2021	Down-gradient well and general monitoring

10.3 Well Installation

Groundwater monitoring well were constructed during the date by adopting the following methodology:

- 50mm diameter, Class 18PVC threaded and flush joined casing and 0.45 machine-slotted screens were used;
- The screen extended 1m above and 2m below the standing water table measured after drilling;
- Coarse, washed sand and gravel was placed in the annulus surrounding the piping to a height of 0.2m above the screen;
- Bentonite pellets were placed in the annulus above the sand to form an impermeable plug of a thickness of 1.0m and near the top of the well to prevent surface runoff from entering directly into the well;
- A PVC cap was placed on the casing; and
- 100mm diameter stainless steel flushed covers were used for all well finishes and concreted onto the ground surface.

A summary of the groundwater monitoring well construction details installed are listed in the table below and are also presented in full detail within their respective borehole logs included in Appendix K.

Table 19: Summary of Well Construction Details

Well ID	Total Depth (m BGL)	Screening Zone (m BGL)	Surface Level (RL AHD)	Lithological Description
GW1	9.1	6.1-9.1	45.68	Shale bedrock
GW2	7.9	4.9-7.9	48.47	Shale bedrock
GW4	7.7	4.7-7.7	46.07	Shale bedrock
GW5	9.0	6.0-9.0	46.80	Shale bedrock

10.4 Groundwater Gauging

Prior to purging and sampling of groundwater at each monitoring well, groundwater levels were measured and the presence of phase-separated hydrocarbons (PSH) were checked using a hand bailer. No PSH were observed.

Measurements of groundwater well depths were also obtained to assess whether siltation of the well had occurred following well development. No siltation was observed.

10.5 Groundwater Purging and Sampling

Wells were purged and sampled using a bailer with a low flow attachment.

Purging of groundwater was carried out until three consecutive readings (where possible) from a calibrated Water Quality Meter were measured within the stabilisation criteria specified for each physico-chemical parameters listed in the table below.

Table 20: Groundwater Quality Stabilisation Criteria

Parameter	Measurement Unit	Stabilisation Variance
Temperature	ºC	± 0.2
pH	pH units	± 0.05
Oxidation Reduction Potential (ORP)	mV	± 10 mV
Dissolved Oxygen (DO)	mg/L	± 0.2 or 10%
Electrical Conductivity	mS/cm	± 3%

Groundwater samples were collected only after stabilised groundwater quality readings were achieved to ensure representative sampling and then transferred into laboratory-supplied sample containers appropriate for laboratory analyses. A copy of the calibration certificate can be found in Appendix L.

10.6 Laboratory Analyses

Groundwater samples were submitted to their respective laboratories as specified in Section 11.2. The schedules of analysis for each sampling batch are presented in Appendix O.

11 QUALITY ASSURANCE / QUALITY CONTROL

11.1 Field QA/QC

11.1.1 General

The frequency required for each field quality assurance / quality control (QA/QC) sample is presented in the table below.

Table 21: QA/QC Sampling Frequency

	Intra-Lab Duplicates	Inter-Lab Duplicates	Rinsates	Trip Blanks	Trip Spikes
Sampling Frequency	1 in 20 primary samples	1 in 20 primary samples	1 / Day	1 / Day	1 / Day

11.1.2 Field Duplicates

Duplicates of primary samples were collected to enable the assessment of variability in analyte concentrations between samples collected from the same sampling point. The tables below list the duplicate soil and groundwater samples collected with their corresponding primary samples.

Table 22: Soil Field Duplicate Samples

Primary Sample ID	Sample Depth (m bgl)	Blind Duplicate ID	Split Duplicate ID	Date Sampled
BH7	0.3 – 0.4	D1	SS1	31.08.2021
BH4	0.2 – 0.4	D2	SS2	31.08.2021

Table 23: Groundwater Field Duplicate Samples

Primary Sample ID	Screen Zone (m bgl)	Blind Duplicate ID	Split Duplicate ID	Date Sampled
GW1	6.1-9.1	GWD1	GWSS1	02.09.2021

11.1.3 Rinsates

Rinsate samples recovered for each day in which sampling took place to identify possible cross contamination between the sampling locations are listed in the table below.

Table 24: Rinsate Samples

Sample ID	Equipment Type	Sample Media	Date Collected
R1	Hand Trowel	Soil	31.08.2021
R2	WQM	Water	02.09.2021

11.1.4 Trip Blanks / Spikes

Trip spike and trip blank samples were collected to assess the effect of sample handling on volatile concentrations in the samples collected and are listed in the table below.

Table 25: Trip Blank/Trip Spikes

Sample ID	QC Sample Type	Media	Date Collected
TB1	Trip Blank	Soil	31.08.2021
TS1	Trip Spike	Soil	31.08.2021
TB2	Trip Blank	Groundwater	02.09.2021
TB2	Trip Spike	Groundwater	02.09.2021

11.1.5 Sample Handling, Storage and Transport

The following sampling handling, storage and transport procedures were adopted to ensure sample integrity:

- Samples were collected in laboratory supplied containers. A list of sample preservation methods and the types of sample containers used are attached in Appendix M.
- Soil and groundwater sample containers were placed immediately into a chilled cooler box and dispatched to their respective analytical laboratories on the same day. If this was not possible, samples were temporarily held overnight in the Aargus office refrigerator at a temperature of no greater than 4 ºC and dispatched the following day.
- A Chain of Custody form (COC) was completed for all samples collected and included with the samples for transport to their respective laboratories for chemical analysis. Copies of COCs are included in Appendix N.
- All glass bottles were individually bubble wrapped for protection and insulated containers/coolers were used for sample shipment.
- Disposable nitrile gloves were used for OH&S purposes and were changed between every sample location.

11.1.6 Decontamination Procedures

The decontamination of non-dedicated sampling equipment was achieved by washing with phosphate-free detergent and tap water, followed by a final rinse with distilled water. Decontamination was conducted after the collection of samples at each sample location. A clean pair of disposable gloves was used when handling each sample.

The drilling augers were decontaminated between sampling locations by physically removing soil material between boreholes, washing the augers with Decon 90 and rinsing them with water.

We highlight that separate bailer chord and disposable bailers were used for each monitoring well during development and when sampling. These equipment items were not subject to decontamination procedures.

11.1.7 Calibration of Equipment

The 10.6eV lamp of the PID was calibrated with isobutylene gas at 100ppm prior to commencement of fieldwork and prior to commencement of each day's fieldwork. The battery in the PID unit was recharged after every day's use in the field. The Water Quality Meter was calibrated prior to the commencement of groundwater sampling.

Copies of calibration records for each relevant item of equipment used can be found in Appendix L.

11.2 Laboratory QA/QC

11.2.1 Laboratories Used

The following NATA-accredited laboratories were commissioned to carry out laboratory analysis of soil and groundwater samples collected:

- Primary Laboratory – Eurofins MGT (Sydney)
- Secondary Laboratory – ALS Environmental
- ASET Environmental - conducted asbestos analysis on selected primary soil samples

These laboratories also operate Quality Systems that are designed to comply with ISO/IEC 17025. All primary samples, blind duplicates, rinsate samples, trip blank/spikes were dispatched to the primary laboratory. All split samples were dispatched to the secondary laboratory. Laboratory Certificates of Analysis are included in Appendix N.

11.2.2 Holding Times

The holding times for chemicals analysed are presented in Appendix M and were based on USEPA methods, Standard Methods for the Examination of Water and Wastewater (APHA).

11.2.3 Test Methods and Practical Quantitation Limits

The test methods adopted by the laboratories are listed in Appendix M and Practical Quantitation Limits (PQLs) adopted are specified within the Laboratory Certificates of Analysis included in Appendix N.

The methods used by the laboratories generally comply with those listed in the NEPM such as Standards Australia and International standards (US EPA SW-846, APHA 2005, ASTM 2008).

Alternate methods may be used by the laboratories however the alternative method must be at least rigorous and reliable as the reference method, and either that:

- it has been validated against an appropriate certified reference material (CRM) on the range of soil types and concentrations most likely to be analysed. This requires adequate recovery of analytes using CRMs during method validation, as well as regular participation in national proficiency trials by bodies such as the National Measurement Institute (NMI) or Proficiency Testing Australia (PTA) or other accredited provider; and / or

- it has been verified against quantitative data generated by a laboratory that is accredited for the reference method to ISO 17025 by NATA or one of its mutual recognition agreement partners.

The laboratory should document the method performance verification and make the data available for independent audit.

11.3 QA/QC Data Evaluation

A full evaluation of the Data Quality Indicators (DQIs) for both fieldwork and laboratory procedures is presented in Appendix P. These were assessed with reference to Appendix V of the NEPM and Guidelines for the NSW Site Auditor Scheme (3rd ed.), 2017. In summary, the findings of the QA/QC evaluation indicated the following:

- Data Completeness – The data set is considered to be adequately complete.
- Data Comparability – The data set is considered to be adequately comparable.
- Data Representativeness – The data set is considered to be adequately representative.
- Data Precision – The data set is considered to be adequately precise.
- Data Accuracy – The data set is considered to be adequately accurate.

The sampling methods (including sample preservation, transport and decontamination procedures) and laboratory methods followed during this investigation works were consistent with Aargus protocols and were found to meet the DQOs for this project.

It is therefore considered that the data is sufficiently reliable and that the results can be used for the purpose of this project.

12 FIELD OBSERVATIONS

12.1 Geology

Based on surface and sub-surface conditions observed during the intrusive investigation, the surface and sub-surface profile across the site is summarised in the table below.

Table 26: Summary of Geological Observations

Geological Unit	Lithological Description	Depth Ranges: Top to Base (m bgl)
NA	Concrete / Bitumen	
Topsoil / Fill	Sandy Clay, low to medium plasticity, dark brown with medium gravel and asphalt pieces	Ground level to 0.9m
Natural Soils	Silty CLAY	0.3m to 2.0m
Bedrock	Shale	2.0m to 9.1m

The following additional observations were made:

- No hydrocarbon staining was observed within any of the borehole locations.
- No hydrocarbon odours were encountered within any of the borehole locations.
- No fibre-containing fragments were observed in any of the borehole samples.

We recommend that this section be read in conjunction with Figure 4 (Sample Location Plan) in Appendix A and the Daily Work Sheets in Appendix L.

12.2 Field Headspace Results

Ionisable VOC detections in PID readings taken from soil samples subjected to field headspace analysis were recorded between 1.1ppm and 40.5ppm. The PID field record forms can be found in Appendix L.

12.3 Groundwater Observations during Drilling

Seepage or groundwater not detected during the entire drilling process for all of the boreholes across the site.

12.4 Groundwater Monitoring Results

12.4.1 Groundwater Measurements

Groundwater levels measured and observations made during the monitoring event carried out on the 2nd September 2021 are summarised in the table below.

Table 27: Groundwater Elevations and Observations

Well ID	Well Depth (m BGL)	R.L. (m AHD)	Groundwater Depth Measured (m BGL)	Groundwater Level (m AHD)	PSH Depth (m BGL) / Thickness (mm)
GW1	9.1	45.68	5.07	40.61	None
GW2	7.9	48.47	6.50	41.97	None
GW4	7.7	46.07	No water	-	None
GW5	9.0	46.80	6.79	40.01	None

12.4.2 Physio-Chemical Parameters

The stabilised measurements taken for each groundwater physico-chemical parameter are summarised in the table below. Copies of detailed field measurement records for each monitoring well location are presented in Appendix L.

Table 28: Physico-Chemical Parameters

Well ID	Temperature (°C)	pH	EC (S/cm)	Redox (mV)	DO (ppm)
GW1	16.6	7.33	14.456	209.2	11.2
GW2	16.7	7.39	8.148	212.3	10.5
GW5	16.5	7.06	12.348	221.3	11.5

13 LABORATORY RESULTS

13.1 General

A comparison of soil and groundwater laboratory results against their respective assessment criteria (as specified in Section 8) are presented in the summary tables in Appendix O. Certificates of laboratory analysis are attached in Appendix N. A discussion of the results is presented in the following sub-sections.

13.2 Soil Results

13.2.1 Heavy Metals

13.2.1.1 Health Investigation Levels (HILs)

As indicated in Table A1, the concentrations of the discrete heavy metals were below the Health Investigation Level (HIL) for a residential unit development, that being the HIL 'B'.

13.2.1.2 Ecological Investigation Levels (EILs)

As indicated in Table A1, the arsenic concentrations were below the Ecological Investigation Level (EIL) for urban residential and public open space.

The EILs for Copper, Zinc and Nickel and Chromium III were derived by adding the Ambient Background Concentration (ABC) to the Added Contaminant Limits (ACL), as per the following formula $EIL = ABC + ACL$.

The ABC for the site has been determined by recovering a sample from an appropriate reference point, that being boreholes BH3 (0.6-0.7m), BH12 (0.5-0.6m) and BH19 (0.6-0.7m) that being samples of natural strata from within the site.

The ABC concentrations are summarised in Table A3.

The results of pH and CEC and %clay for the natural soil samples are summarised in Table A2. Based on the results in Table A2, the site ACLs for Cu, Ni and Zn have been derived and are provided in Table A3.

The calculated EIL for Cu, Pb, Ni and Zn, after appropriate rounding, have been summarised in Table A3.

Therefore, as shown in Table A4, the, Cu, Pb, Ni and Zn concentrations were below the site derived EILs.

13.2.2 TRH, BTEX, NAPHTHALENE &/OR BENZO(a)PYRENE

13.2.2.1 Health Screening Levels (HSLs)

As indicated in Table B1, the F1 (C_6-C_{10}), F2 (>C_{10}-C_{16}), benzene, toluene, ethyl benzene, xylenes and naphthalene concentrations were below the HSL 'A' & HSL 'B' for a clay soil profile with a source depth of "0m to <1m".

13.2.2.2 Ecological Screening Levels (ESLs)

As indicated in Table B2, the F1 (C_6-C_{10}), F2 (>C_{10}-C_{16}), F3 (C_{16}-C_{34}), F4 (C_{34}-C_{40}), benzene, toluene, ethyl benzene, xylenes and benzo(a)pyrene concentrations were below the ESL for a fine grained soil texture in an "urban residential and public open space" environment.

13.2.2.3 Management Limits

As indicated in Table B3, the F1 (C_6-C_{10}), F2 (>C_{10}-C_{16}), F3 (C_{16}-C_{34}) and F4 (C_{34}-C_{40}) concentrations were below the Management Limits for a fine grained soil texture in an "residential parkland and public open space" environment.

13.2.3 PAH, OCP & PCB

13.2.3.1 Health Investigation Levels (HILs)

As indicated in Table C, the concentrations of the benzo(a)pyrene (as TEQ) and Total PAH, were below the Health Investigation Level (HIL) for a residential unit development, that being the HIL 'B'.

As indicated in Table D, the concentrations of the OCP and PCB were below the Health Investigation Level (HIL) for a residential unit development, that being the HIL 'B'.

13.2.3.2 Ecological Investigation Levels (EILs)

As indicated in Table C, the concentrations of naphthalene were below the Ecological Investigation Level (EIL) for urban residential and public open space.

As indicated in Table D, the concentrations of DDT/DDE/DDD were below the Ecological Investigation Level (EIL) for urban residential and public open space.

13.2.3.3 Ecological Screening Levels (ESLs)

As indicated in Table C, the benzo(a)pyrene concentrations were below the ESL for a fine grained soil texture in an "urban residential and public open space" environment.

13.2.4 Asbestos

As indicated in Table E, asbestos was not detected in any of the samples analysed.

13.3 Groundwater Results

13.3.1 Heavy Metals

As indicated in Table E, the heavy metal concentrations were below the assessment criteria (Fresh water and water for recreational purposes) with exception of the following:

- The arsenic concentration of 110µg/L in GW2 detected above the adopted criteria of 24µg/L for fresh water and 50µg/L for water for recreational purposes.
- Cadmium concentrations in GW1, GW5 & Duplicate GWD1 detected above the adopted criteria of 0.2µg/L for fresh water.
- The chromium concentration of 3µg/L in Split GWSS1 detected above the adopted criteria of 1µg/L for fresh water.
- Copper concentrations in GW1, GW5 & Duplicate GWD1 detected above the adopted criteria of 1.4µg/L for fresh water.
- The nickel concentration of 25µg/L in GW2 detected above the adopted criteria of 11µg/L for fresh water.

13.3.2 TRH, BTEX & PAH

13.3.2.1 Fresh & Recreational

As indicated in Table F, the BTEX concentrations were either less than the laboratory limit of reporting (LOR) and/or below the assessment criteria (fresh water and water for recreational purposes).

13.3.2.2 Health Screening Levels (HSLs)

As indicated in Table G, the F1 (C_6-C_{10}), F2 (>C_{10}-C_{16}), benzene, toluene, ethyl benzene, xylenes and naphthalene concentrations were below the HSL ‘A’ & HSL ‘B’ for a clay soil profile with a source depth of “4m to <8m”.

13.3.3 PAH

As indicated in Table H, the PAH concentrations were below the assessment criteria (Fresh water and water for recreational purposes).

14 DISCUSSION OF RESULTS

14.1 Soil Quality

The soil assessment revealed the following:

- Heavy metals concentrations were below the HIL 'B' and site derived EILs.
- TPH / BTEXN concentrations were below the HSL 'A&B', ESLs and Management Limits.
- PAH, OCP & PCB concentrations were below the HIL 'B', EILs and ESLs.
- Asbestos was not detected in any of the samples analysed.

14.2 Groundwater Quality

The groundwater assessment revealed the following:

- Heavy metals concentrations analysed in groundwater (with the exception of arsenic, cadmium, chromium, copper and/or nickel) appeared to fluctuate between meeting or exceeding their respective assessment criteria at various monitoring locations across the site. It was considered that the heavy metals present within the bedrock aquifer were likely to be background concentrations given that no other potential sources of contamination were identified within the immediate vicinity of the site.
- TRH and BTEX concentrations were below the site assessment criteria.
- PAH concentrations were below the site assessment criteria.

15 CONCLUSION AND RECOMMENDATIONS

Based on the results of this investigation it is considered that the risks to human health and the environment associated with soil and groundwater contamination at the site is negligible within the context of the proposed use of the site for four buildings for commercial / retail / residential uses including basement car parking and communal open spaces development.

The site is therefore considered to be suitable for the proposed use.

Any soils requiring removal from the site, as part of future site works, in particular to those beneath the existing site features, should be classified in accordance with the "*Waste Classification Guidelines, Part 1: Classifying Waste*" NSW EPA (2014).

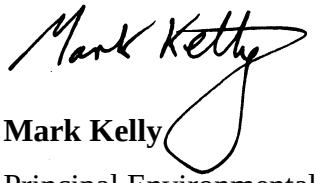
Thank you for the opportunity to undertake this work. We would be pleased to provide further information on any aspects of this report.

For and on behalf of
Aargus Pty Ltd

Written by:

Saad Bun Suleman
Environmental Engineer

Reviewed By:



Mark Kelly
Principal Environmental Consultant

LIMITATIONS

The Aargus assessment is based on the result of limited site investigations and sample testing. Neither Aargus, nor any other reputable consultant, can provide unqualified warranties nor does Aargus assume any liability for site conditions not observed or accessible during the time of the investigations.

Despite all reasonable care and diligence, the materials encountered and concentrations of contaminants measured may not be representative of conditions between the locations sampled and investigated. There is always some disparity in subsurface conditions across a site that cannot be fully defined by investigation. Hence it is unlikely that measurements and values obtained from sampling and testing during environmental works carried out at a site will characterise the extremes of conditions that exist within the site. In addition, site characteristics may change at any time in response to variations in natural conditions, chemical reactions, truck movement or contractor movement of soils and other events, e.g. groundwater movement and or spillages of contaminating substances. These changes may occur subsequent to Aargus investigations and assessment.

This report and associated documentation and the information herein have been prepared solely for the use of the client at the time or writing the report and is valid (for the purposes of management or transport of material) for a period of one month only from the date of issue. Any other reliance assumed by third parties on this report shall be at such parties' own risk. Any ensuing liability resulting from use of the report by third parties cannot be transferred to Aargus.

Whilst this report provides a review of site conditions encountered at sampling locations within the investigation, it should be noted that if materials are proposed to moved from site - Part 5.6, Section 143 of the Protection of the Environment Operations (POEO) Act 1997 states that is an offence for waste to be transported to a place that cannot lawfully be used as a facility to accept that waste. It is the duty of the owner and transporter of the waste to ensure that all material removed from a site must be accompanied by an appropriate waste classification report and materials are disposed of appropriately. An environmental or validation report does not constitute a waste classification report and results are treated

differently. Aargus accepts no liability for the unlawful disposal of waste materials from any site. Aargus does not accept any responsibility for the material tracking, loading, management, transport or disposal of waste from the site. If material is to be removed from a site, before disposal of any material to a licensed landfill is undertaken, the site owner must ensure an appropriate waste classification exists for all materials on the site planning to be removed, the waste producer will need to obtain prior consent from the licensed landfill/recycler. The receiving site should check to ensure that the material received matches the description provided in the report.

Opinions are judgements, which are based on our understanding and interpretation of current regulatory standards, and should not be construed as legal opinions.

Appendix P – Important information about your environmental site report should also be read in conjunction with this report.

REFERENCES

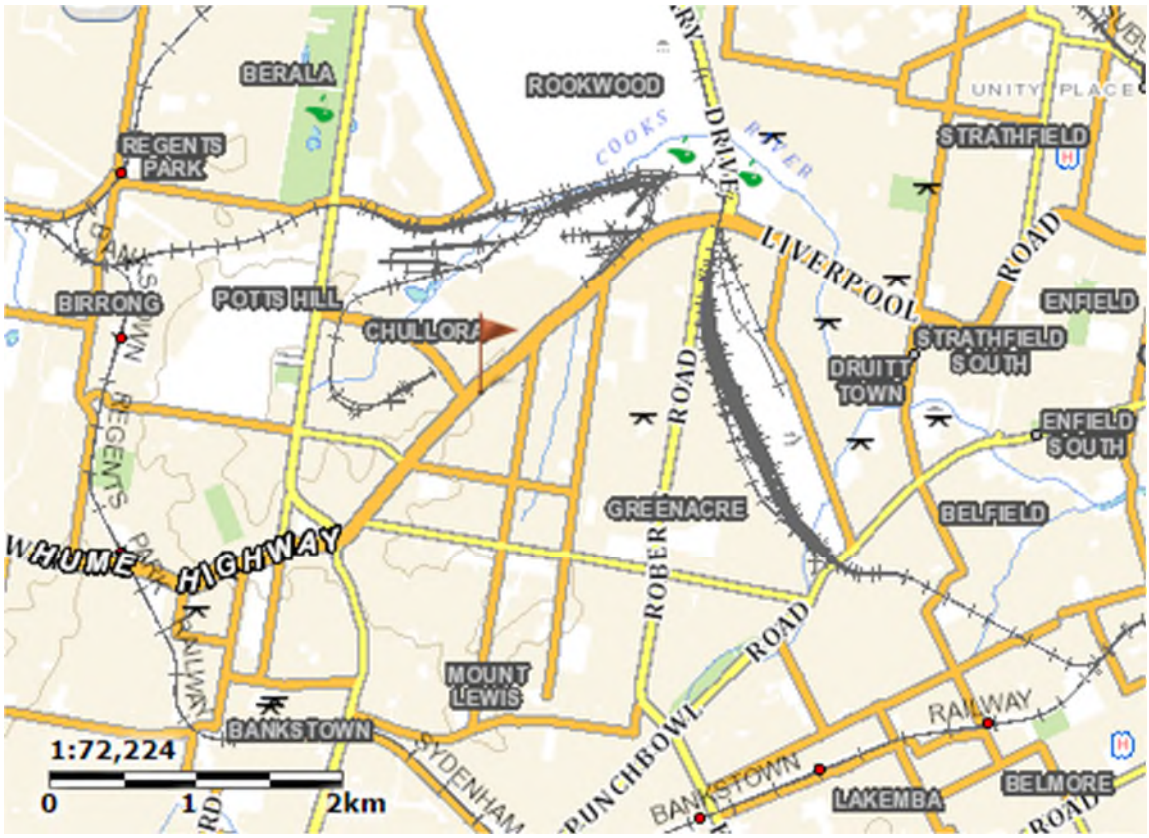
This report was prepared with reference to the following guiding documents:

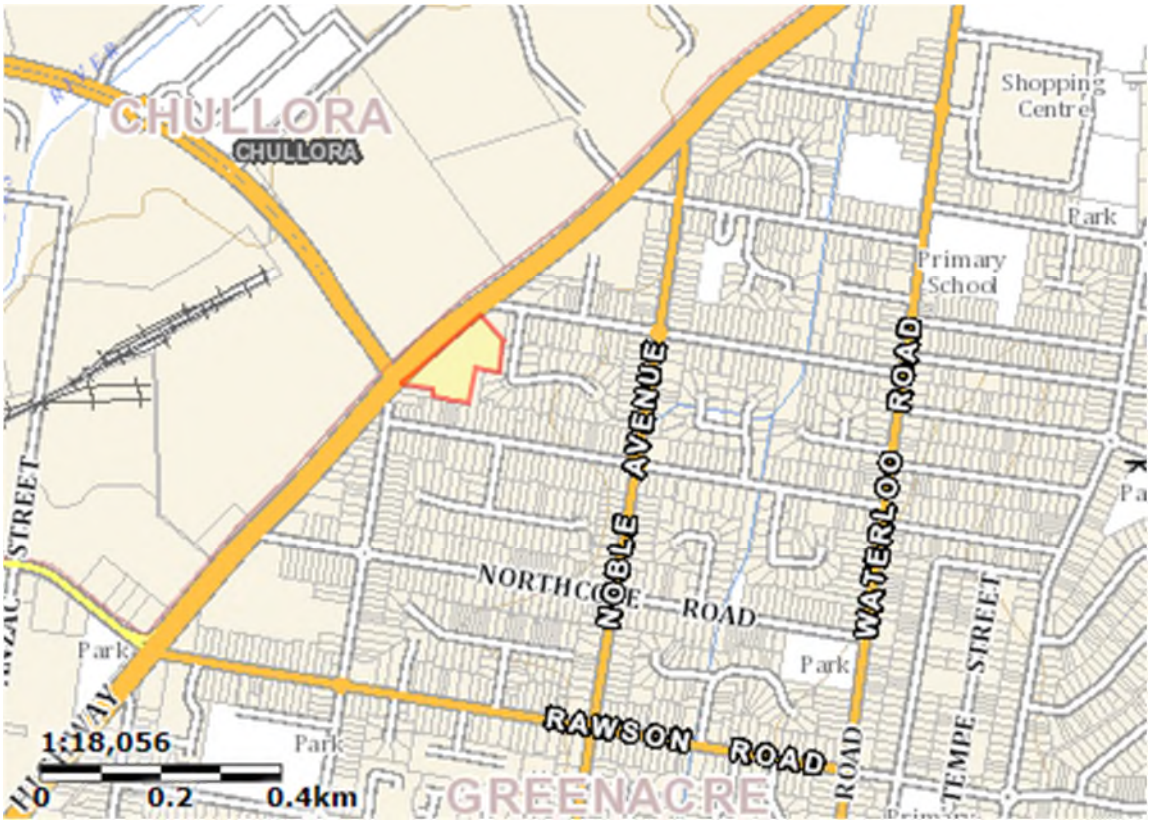
- ANZECC National Water Quality Management Strategy "Australian Water Quality Guidelines for Fresh and Marine Waters", 1992.
- Department of Urban Affairs and Planning – EPA (1998) "Managing Land Contamination – Planning Guidelines – SEPP 55 – Remediation of Land".
- National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No.1).
- NSW DEC, "Guidelines for the Assessment and Management of Groundwater Contamination" (March 2007).
- NSW DEC "Guidelines for the NSW Site Auditor Scheme" (2017, 3rd edition). NSW Environment Protection Authority, Sydney.
- NSW EPA (2014) – "Waste Classification Guidelines, Part 1: Classifying Waste".
- NSW EPA "Guidelines for Consultants Reporting on Contaminated Sites" (2020). NSW Environment Protection Authority, Sydney.
- NSW EPA "Sampling Design Guidelines" (1995). NSW Environment Protection Authority, Sydney.

APPENDIX A

SITE PLANS

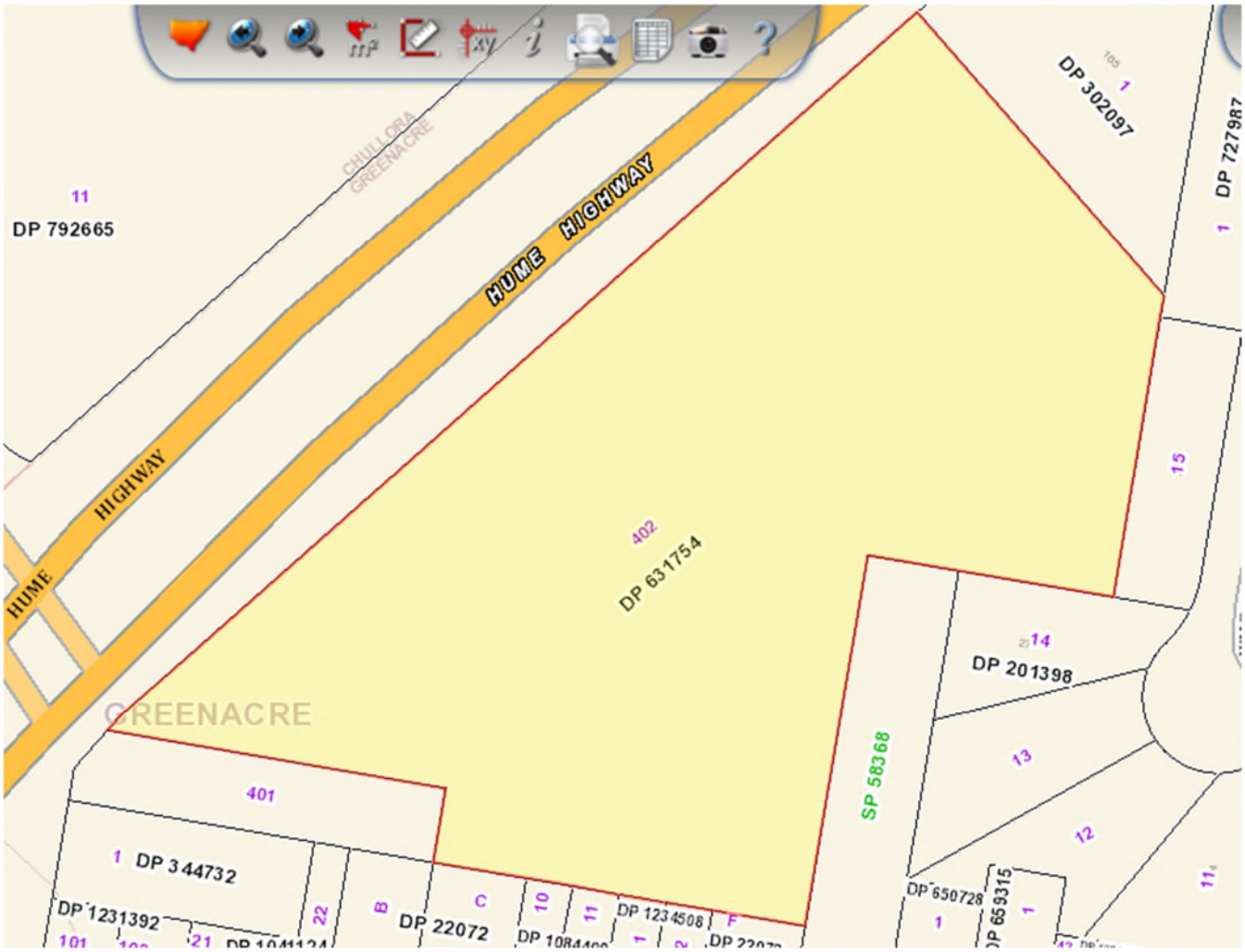
SITE LOCALITY





PROJECT DETAILS			DRAWING DETAILS			
Project Title	Detailed Site Investigation		**Figure No.**	1	**Rev No.**	0
Project No.	ES8338		**Scale**	As Shown	**Size**	A4
Client	Iris Capital Pty Ltd		**Drawn by**	SBS	**Date**	30.08.2021
Site Address	167 Hume Hwy, Greenacre NSW		**Approved by**	MK	**Date**	30.08.2021

LOT & DEPOSITED PLAN



PROJECT DETAILS		DRAWING DETAILS			
Project Title	Detailed Site Investigation	**Figure No.**	2	**Rev No.**	0
Project No.	ES8338	**Scale**	1:1,128	**Size**	A4
Client	Iris Capital Pty Ltd	**Drawn by**	SBS	**Date**	30.08.2021
Site Address	167 Hume Hwy, Greenacre NSW	**Approved by**	MK	**Date**	30.08.2021

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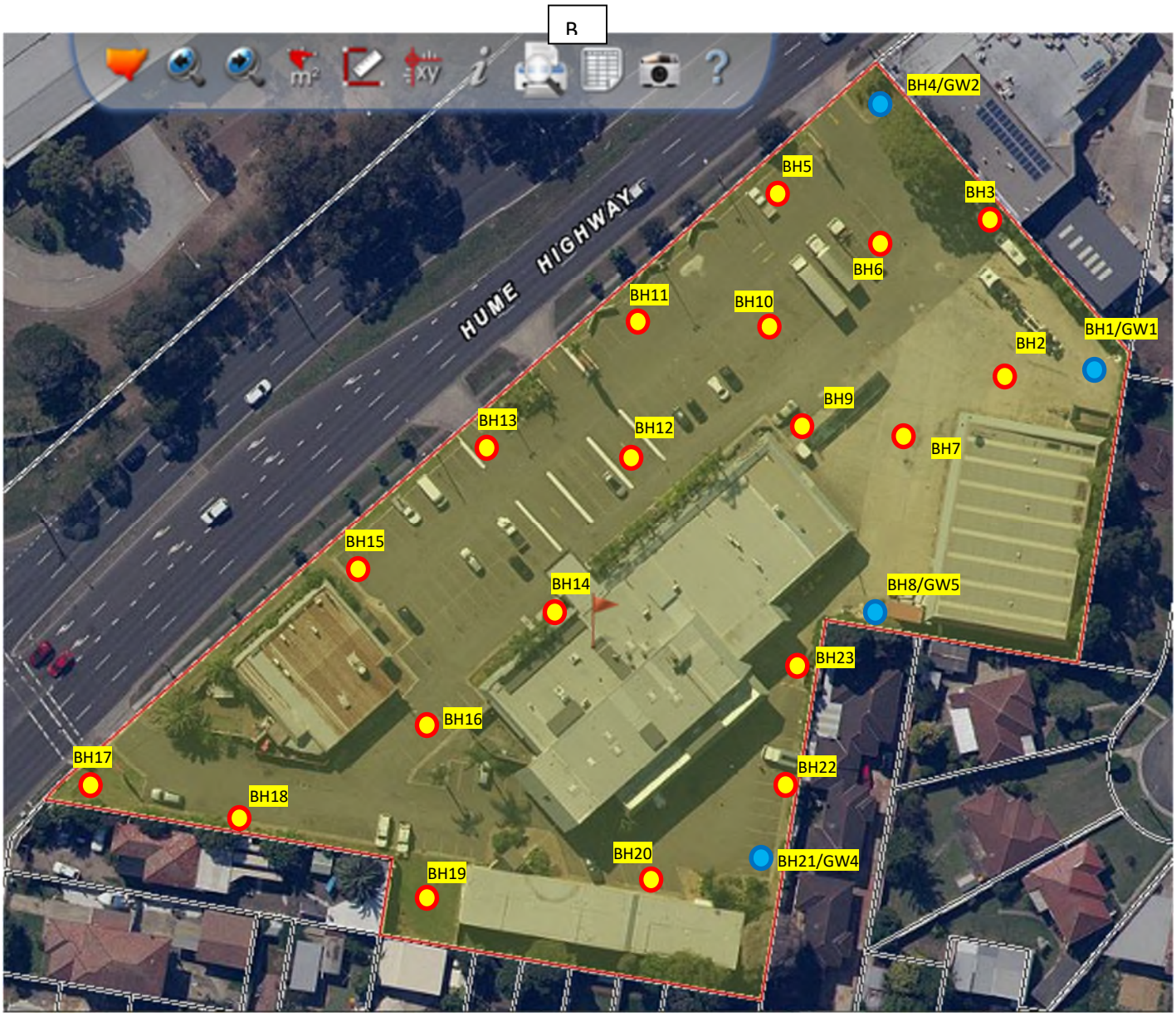
SITE FEATURES

LEGEND

1. Brick building with metal roof – used as a restaurant
2. Brick and concrete building with metal roof – used as a hotel/tavern
3. Two-storey brick and concrete building with metal roof – used as a hotel/tavern
4. Two-storey brick building with metal roof – used as a motel
5. Brick building with metal roof – used as an auto repair workshop
6. Bitumen sealed driveway and car park
7. Concrete sealed driveway and car park
8. Grass covered area
9. Metal container

PROJECT DETAILS			DRAWING DETAILS			
Project Title	Detailed Site Investigation		**Figure No.**	3	**Rev No.**	0
Project No.	ES8338		**Scale**	1:1,128	**Size**	A4
Client	Iris Capital Pty Ltd		**Drawn by**	SBS	**Date**	30.08.2021
Site Address	167 Hume Hwy, Greenacre NSW		**Approved by**	MK	**Date**	30.08.2021

BOREHOLE LOCATIONS



LEGEND

- Site Boundary
- Borehole location
- Groundwater Monitoring Well

PROJECT DETAILS		DRAWING DETAILS			
Project Title	Detailed Site Investigation	**Figure No.**	4	**Rev No.**	0
Project No.	ES8338	**Scale**	1:1,128	**Size**	A4
Client	Iris Capital Pty Ltd	**Drawn by**	SBS	**Date**	30.08.2021
Site Address	167 Hume Hwy, Greenacre NSW	**Approved by**	MK	**Date**	30.08.2021

Aargus

BOREHOLE LOCATIONS ON 1943 AERIAL

LEGEND

- Site Boundary
- Borehole location
- Groundwater Monitoring Well

PROJECT DETAILS		DRAWING DETAILS			
Project Title	Detailed Site Investigation	**Figure No.**	5	**Rev No.**	0
Project No.	ES8338	**Scale**	1:1,128	**Size**	A4
Client	Iris Capital Pty Ltd	**Drawn by**	SBS	**Date**	30.08.2021
Site Address	167 Hume Hwy, Greenacre NSW	**Approved by**	MK	**Date**	30.08.2021

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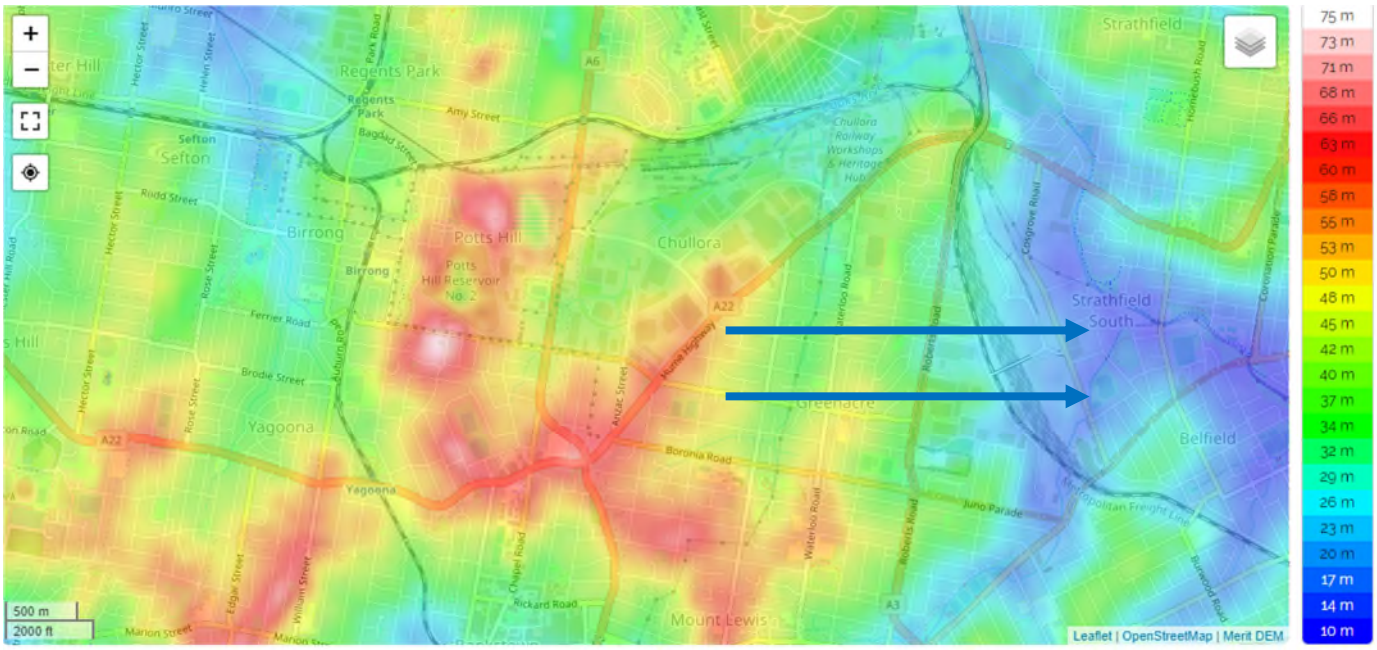
INFERRED GROUNDWATER FLOW DIRECTION

N



PROJECT DETAILS		DRAWING DETAILS			
Project Title	Detailed Site Investigation	**Figure No.**	6	**Rev No.**	0
Project No.	ES8338	**Scale**	1:1,128	**Size**	A4
Client	Iris Capital Pty Ltd	**Drawn by**	SBS	**Date**	30.08.2021
Site Address	167 Hume Hwy, Greenacre NSW	**Approved by**	MK	**Date**	30.08.2021

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APPENDIX B

PROPOSED DEVELOPMENT PLANS & SITE SURVEY PLANS

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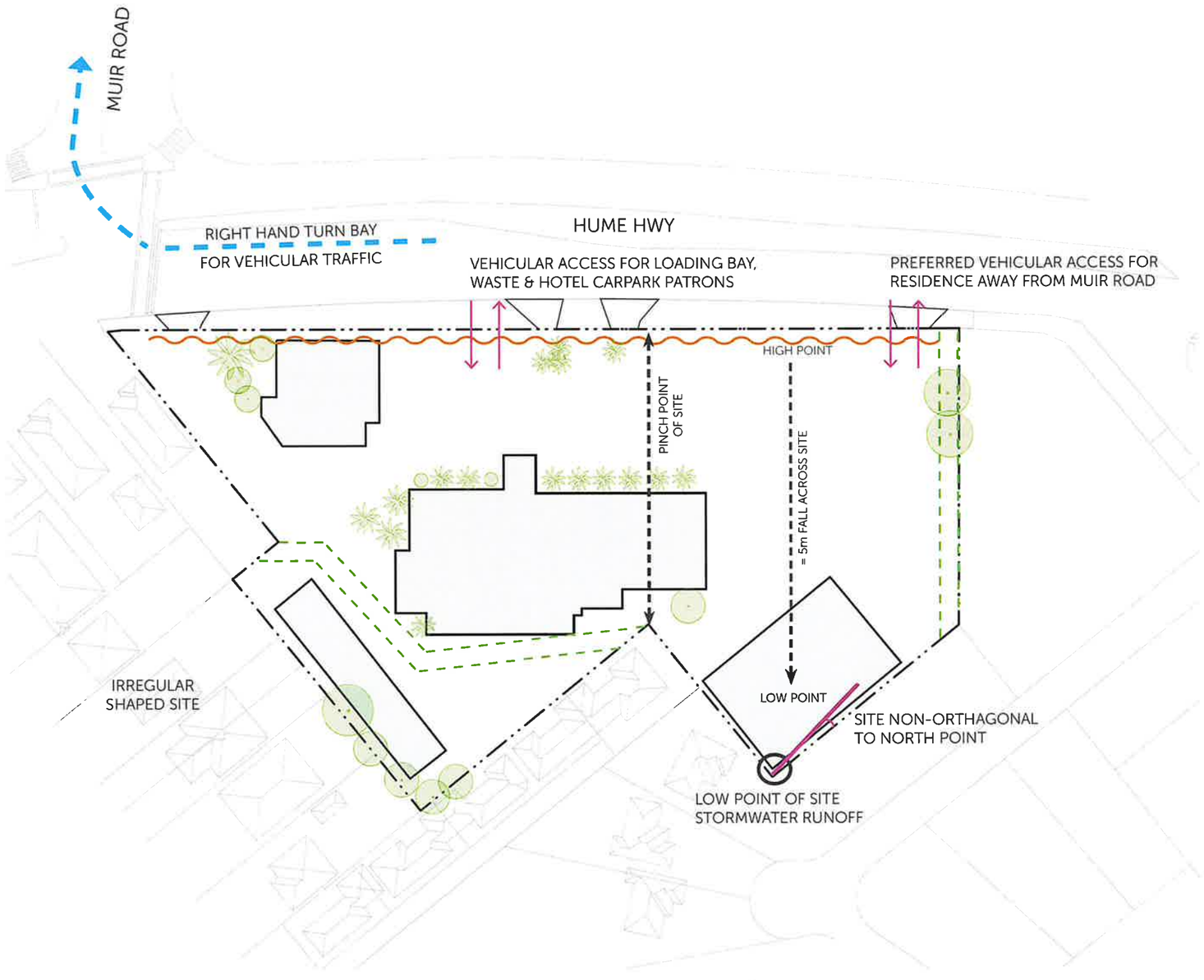
2

SITE CONSTRAINTS

- Irregular geometry of site present separation challenges when siting the buildings
- Approximate 5m slope to south-east corner of site.
- Existing stormwater easement to NE & S of site



KEY

Acoustic attenuation to Hume Highway

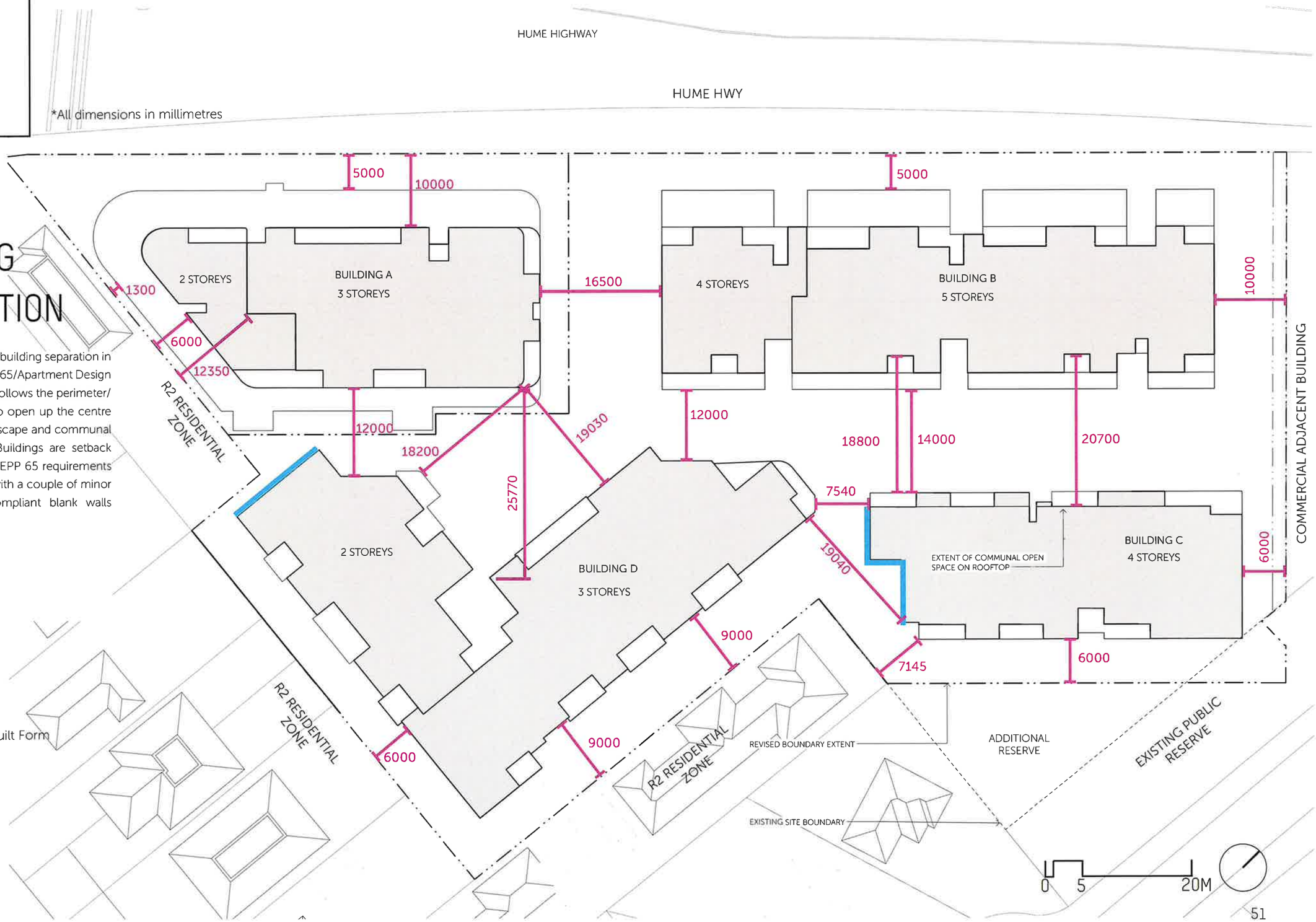
Existing easement

5

*All dimensions in millimetres

BUILDING SEPARATION

The proposal achieves building separation in accordance with SEPP 65/Apartment Design Guide. The built form follows the perimeter/ boundary of the site to open up the centre of site and create landscape and communal space opportunities. Buildings are setback from boundaries per SEPP 65 requirements for habitable spaces, with a couple of minor exceptions where compliant blank walls have been provided.



KEY

- Enclosed Built Form
- Balconies
- Blank Walls

GROUND FLOOR PLAN

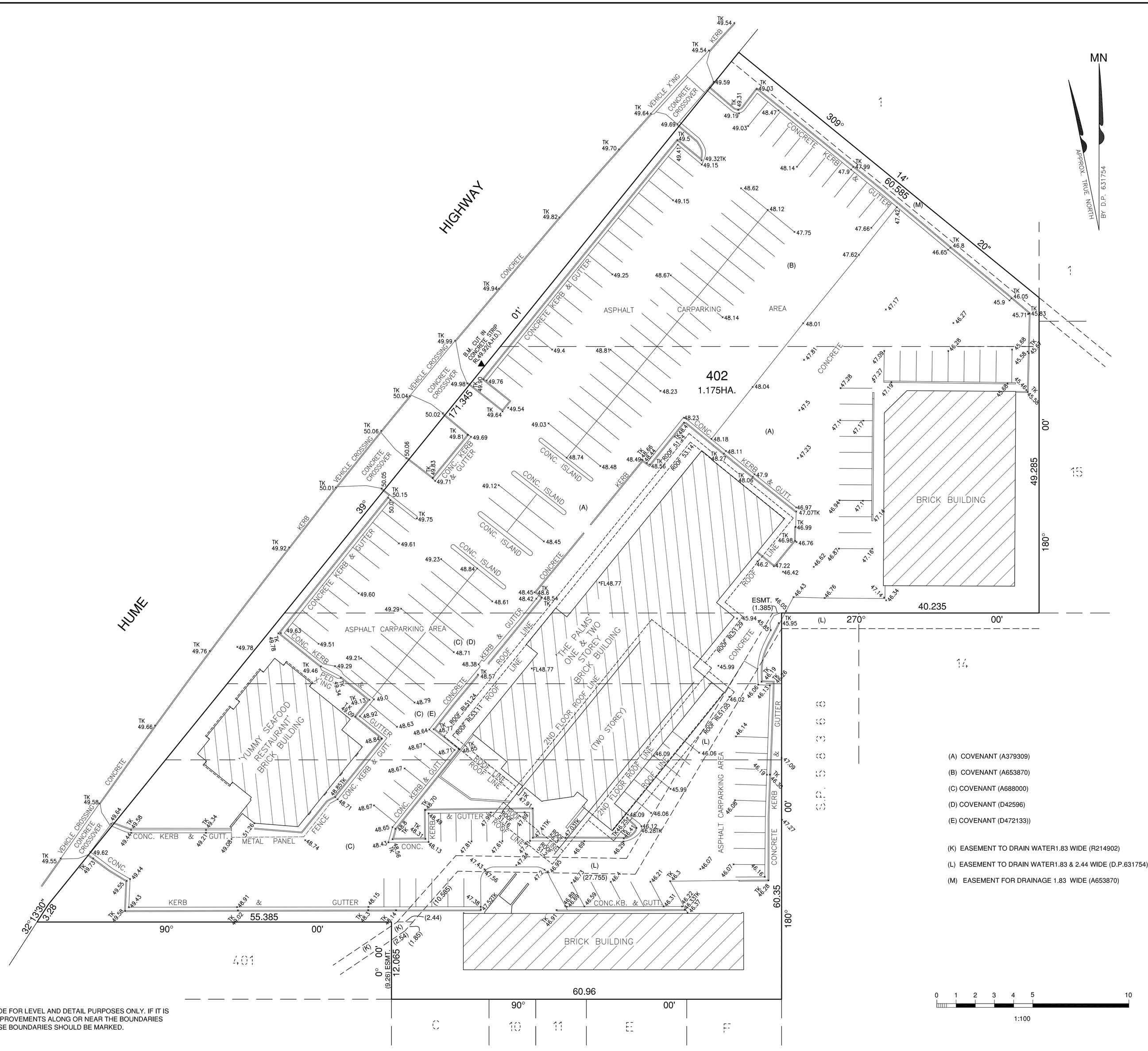
KEY

Dual Aspect

Single Aspect

Indicative Cross Ventilation

0 5 20M



THIS SURVEY HAS BEEN MADE FOR LEVEL AND DETAIL PURPOSES ONLY. IF IT IS INTENDED TO ERECT ANY IMPROVEMENTS ALONG OR NEAR THE BOUNDARIES OF THE SUBJECT LAND THOSE BOUNDARIES SHOULD BE MARKED.

NOTES

1.
2. RELATIONSHIP OF IMPROVEMENTS TO BOUNDARIES IS DIAGRAMMATIC ONLY. NO BOUNDARY SURVEY HAS BEEN MADE. DO NOT SCALE OFF THIS PLAN WHERE OFFSETS ARE CRITICAL, THEY SHOULD BE CONFIRMED BY A FURTHER SURVEY.
3. SERVICES SHOWN HEREON HAVE BEEN DETERMINED FROM VISUAL EVIDENCE ONLY. PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON THE SITE, THE RELEVANT AUTHORITY SHOULD BE CONTACTED TO ESTABLISH DETAILED LOCATION AND DEPTH.
4. THE BEARINGS ON THESE PLAN BOUNDARIES, ARE FROM PLANS OF THE DEPARTMENT OF LANDS. THEY ARE ON MAGNETIC MERIDIAN. IF ACCURATE TRUE NORTH IS REQUIRED, A FURTHER SURVEY WOULD BE NECESSARY.

LEGEND

TK DENOTES TOP KERB

FL DENOTES FLOOR LEVEL

REV.	AMENDMENTS	DATE

DATUM: AUST HEIGHT DATUM

ORIGIN: SSM 141308 RL 49.76 (AHD)

SOURCE: S.C.I.M.S.

PLAN SHOWING LEVELS & DETAILS OVER LOT 402 IN D.P. 631754 AT No. 167 HUME HIGHWAY, CHULLORA FOR IRIS CAPITAL C/- PAUL KELLY DESIGN

(A) COVENANT (A379309)

(B) COVENANT (A653870)

(C) COVENANT (A688000)

(D) COVENANT (D42596)

(E) COVENANT (D472133))

(K) EASEMENT TO DRAIN WATER1.83 WIDE (R214902)

(L) EASEMENT TO DRAIN WATER1.83 & 2.44 WIDE (D.P.631754)

(M) EASEMENT FOR DRAINAGE 1.83 WIDE (A653870)

CONSULTING SURVEYORS

WATSON BUCHAN PTY.LTD.

P.O. BOX 176
CARINGBAH N.S.W. 1495
PHONE: 9524 4073
FAX: 9540 1387
EMAIL : surveyor@watsonbuchan.com.au

DRAWN: B.M/S.C.	CHECKED: J.W.
SCALE: 1:100 1:300@A1	DATE OF SURVEY: 16/5/2014
SURVEYORS REFERENCE: 14/204	REVISION: -

APPENDIX C

SITE PHOTOGRAPHS

Aargus

SITE PHOTOGRAPHS

Client:	Iris Capital
Project:	DSI
Site Location:	167 Hume highway, Greencre NSW
Job No.:	ES8338
Photos Taken On:	31.08.2021
Photos Taken By:	SBS

Aargus

Photograph Nº 1

View of: North eastern portion of the site occupied by single-storey brick building with metal roof utilized as an auto repair workshop.

Photograph Nº 2

View of: North eastern portion of the site showing the auto repair workshop and vehicle parking lot.

Photograph Nº 3

North eastern portion of the site showing the back side of the site occupied by single-storey brick building with metal roof utilized as an auto repair workshop.

Photograph Nº 4

View of: Eastern portion of the site showing the backside of the site occupied by single-storey brick building with metal roof utilized as an auto repair

Photograph Nº 5

View of: Eastern corner of the site showing the backside of the site occupied by single-storey brick building with metal roof utilized as an auto repair workshop.

Photograph Nº 6

View of: Eastern portion of the site showing the front of the auto repair workshop and metal container.

Photograph Nº 7

View of: Eastern portion of the site showing the backside of the site occupied by brick building a utilized as the main hotel building.

Photograph Nº 8

View of: South eastern portion of the site occupied by a two-storey brick building with metal roof used as a Motel.

Photograph Nº 9

View of: South eastern portion of the site showing the southern side of the main hotel building and vehicle parking lot.

Photograph Nº 10

View of: South western corner of the site occupied by a single-storey brick building with metal roof utilized as a restaurant.

Photograph Nº 11

View of: North western corner of the site from Hume Highway showing the entrance to the site.

Photograph Nº 12

View of: Central western portion of the site showing the main hotel building and vehicle parking lot.

Photograph Nº 13

View of: South western portion of the site from Hume Highway, occupied by a single-storey brick building with metal roof utilized as a restaurant.
Photo sourced from Google on 01.09.2021

Photograph Nº 14

View of: Central portion of the site showing the western side of the main hotel building and vehicle parking lot. Photo sourced from Google on 01.09.2021

APPENDIX D

LAND TITLE INFORMATION

Aargus

LAND REGISTRY SERVICES

Direct Info
Quick and easy online

Title Search

06/09/2021 05:15 PM

Client Reference: DI-ES8338

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 402/631754

SEARCH DATE	TIME	EDITION NO	DATE
6/9/2021	5:16 PM	13	8/9/2018

NO CERTIFICATE OF TITLE HAS ISSUED FOR THE CURRENT EDITION OF THIS FOLIO.
CONTROL OF THE RIGHT TO DEAL IS HELD BY WESTPAC BANKING CORPORATION.

LAND

LOT 402 IN DEPOSITED PLAN 631754
AT GREENACRE
LOCAL GOVERNMENT AREA CANTERBURY-BANKSTOWN
PARISH OF BANKSTOWN COUNTY OF CUMBERLAND
TITLE DIAGRAM DP631754

FIRST SCHEDULE

PALMS (CHULLORA) PTY LIMITED (T AI678347)

SECOND SCHEDULE (11 NOTIFICATIONS)

---

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 A379309 COVENANT AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM.
3 A653870 COVENANT AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM.
4 A653870 EASEMENT FOR DRAINAGE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
5 A688000 COVENANT AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM.
6 D42596 COVENANT AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM.
7 D472133 COVENANT AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM.
8 R214902 EASEMENT TO DRAIN WATER AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
9 DP631754 EASEMENT TO DRAIN WATER 1.83 AND 2.44 WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
10 AF75892 LEASE TO YUMMY HOLDINGS PTY LTD OF "YUMMY SEAFOOD

RESTAURANT", 167 HUME HIGHWAY, CHULLORA. EXPIRES: 30/6/2014.

11 AI678348 MORTGAGE TO WESTPAC BANKING CORPORATION

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

DI-ES8338 PRINTED ON 6/9/2021

* Any entries preceded by an asterisk do not appear on the current edition of the Certificate of Title. Warning: the information appearing under notations has not been formally recorded in the Register.

LAND REGISTRY SERVICES

Direct Info
Quick and easy online

Historical Search
06/09/2021 05:16 PM

Client Reference: DI-ES8338

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE

6/9/2021 5:17PM

FOLIO: 402/631754

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 15061 FOL 54

Recorded	Number	Type of Instrument	C.T. Issue
28/3/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
22/9/1988		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
21/3/1989	Y136648	TRANSFER OF MORTGAGE	EDITION 1
7/7/1992	E588548	DISCHARGE OF MORTGAGE	
7/7/1992	E588549	MORTGAGE	EDITION 2
3/12/1996	2661175	MORTGAGE	EDITION 3
24/1/1997	2753711	LEASE	EDITION 4
5/2/1999	5571044	DISCHARGE OF MORTGAGE	EDITION 5
24/5/2000	6807622	DISCHARGE OF MORTGAGE	
24/5/2000	6807623	TRANSFER	
24/5/2000	6807624	MORTGAGE	EDITION 6
28/5/2003	9649456	CAVEAT	
13/11/2003	AA147410	WITHDRAWAL OF CAVEAT	
13/11/2003	AA150569	DISCHARGE OF MORTGAGE	
13/11/2003	AA147444	TRANSFER	EDITION 7
21/11/2005	AB879438	CHANGE OF NAME	
21/11/2005	AB879439	LEASE	EDITION 8
8/5/2006	AC262195	TRANSFER	EDITION 9

8/4/2009 AE585133 CHANGE OF NAME
8/4/2009 AE585134 LEASE EDITION 10

26/11/2009 AF75892 LEASE EDITION 11

16/12/2013 AI248004 REQUEST

24/6/2014 AI678347 TRANSFER

END OF PAGE 1 - CONTINUED OVER

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE

6/9/2021 5:17PM

FOLIO: 402/631754 PAGE 2

Recorded	Number	Type of Instrument	C.T. Issue
24/6/2014	AI678348	MORTGAGE	EDITION 12
12/2/2016	AJ924499	CAVEAT	
8/4/2016	AK332482	ORDER OF COURT	
12/4/2016	AK348190	ORDER OF COURT	
9/5/2016	AK407217	ORDER OF COURT	
20/5/2016	AK439325	REQUEST	
13/7/2016	AK241747	APPLICATION FOR PREPARATION OF LAPSING NOTICE	
13/7/2016	AK528497	REQUEST	
13/7/2016	AK580087	REQUEST	
8/9/2018	AN695391	DEPARTMENTAL DEALING CORD ISSUED	EDITION 13

*** END OF SEARCH ***

LAND REGISTRY SERVICES

Direct Info
Quick and easy online

DI-ES8338 PRINTED ON 6/9/2021

LAND REGISTRY SERVICES

Direct Info
Quick and easy online

06/09/2021 05:21 PM

Form: 01T
Licence: 01-05-025
Licensee: LEAP Legal Software Pty Limited
Firm name: LAS Lawyers & Consultants

TRANSFER

New South Wales
Real Property Act 1900

AI678347X

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the Registrar General to collect the information required by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

STAMP DUTY Office of State Revenue use only

Office of State Revenue
NSW Treasury
Client No: 111272656 2908
Duty: $10.00 Trans No: 752[illegible]
Asst details: TS on Agreement for sale of land

(A) **TORRENS TITLE** 402/631754

(B) **LODGED BY**

Document Collection Box	Name, Address or DX, Telephone, and Customer Account Number if any	CODES
426	SPARKE HELMORE LAWYERS LLPN 123009 S DX 282 SYDNEY PH: 9373 3555 Reference: 686 EYB	T TW

(C) **TRANSFEROR** Coles Group Property Developments Ltd ABN 72 004 428 326

(D) **CONSIDERATION** The transferor acknowledges receipt of the consideration of $21,500,000.00 and as regards

(E) **ESTATE** the abovementioned land transfers to the transferee an estate of fee simple.

(F) **SHARE TRANSFERRED**

(G) Encumbrances (if applicable):

(H) **TRANSFEREE** Palms (Chullora) Pty Limited ACN 167 341 666

(I) **TENANCY:**

DATE

(J) I certify that I am an eligible witness and that the transferor's attorney signed this dealing in my presence.

Signature of witness:

Name of witness: **STEVEN SIRIANOS**
Address of witness: 800 Toorak Road
Hawthorn East Victoria 3123
An Australian Legal Practitioner (within the meaning of the Legal Profession Act 2004)

Certified correct for the purposes of the Real Property Act 1900 by the person(s) named below who signed this instrument pursuant to the power of attorney specified.

Signature of attorney:

Attorney's name: . **Gregory Robert Chubb**
Signing on behalf of: Coles Group Property Developments Ltd
Power of attorney-Book: **4618**
-No.: **967**

Certified correct for the purposes of the Real Property Act 1900 by the person whose signature appears below.

Signature:

Signatory's name: Dion Robert Manca
Signatory's capacity: Solicitor for the Transferee

(K) The transferee's solicitor certifies that the eNOS data relevant to this dealing has been submitted and stored under eNOS ID No. 627930 Full name: Nakita Louise Brown Signature:

** s 117 RP Act requires that you must have known the signatory for more than 12 months or have sighted identifying documentation.*

ALL HANDWRITING MUST BE IN BLOCK CAPITALS.

LAND REGISTRY SERVICES

Direct Info
Quick and easy online

06/09/2021 05:23 PM

Form: 01T
Licence: 03-08-144
Licensee: Freehills

TRANSFEI

nal

New South Wales
Real Property Act 190

AC262195P

on

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) auth required by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

NEW SOUTH WALES DUTY
20-04-2006 0003389626-004

STAMP DUTY Office of State Revenue use only

SECTION 281-ORIGINAL
NO DUTY PAYABLE

(A) **TORRENS TITLE** If appropriate, specify the part transferred
See annexure A

(B) **LODGED BY**

Delivery Box	Name, Address or DX and Telephone	Codes
27C	FREEHILLS Level 32, MLC Centre 19-29 Martin Place SYDNEY NSW 2000 Phone: (02) 9225 5000 DX 361 Sydney Reference (optional): HJA:27C	T TW (Sheriff)

(C) **TRANSFEROR** THEO'S LIQUOR PTY LTD ACN 102 914 661

(D) **CONSIDERATION** The transferor acknowledges receipt of the consideration of $1.00 and as regards

NEW SOUTH WALES DUTY
28-04-2006 0003389626-005

(E) **ESTATE** the land specified above transfers to the transferee an estate in fee simple

VENDOR DUTY
NO DUTY PAYABLE
SECTION 162Y(S.281)

(F) **SHARE TRANSFERRED** .....

.....

(G) Encumbrances (if applicable): 1. 2. 3.

(H) **TRANSFEREE** COLES MYER PROPERTY DEVELOPMENTS LIMITED ACN 004 428 326

(I) **TENANCY:**

DATE 24 / 6 / 05
dd mm yyyy

(J) I certify that the transferor, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this transfer in my presence.

Signature of witness:

Name of witness: See annexure A

Address of witness:

Certified correct for the purposes of the Real Property Act 1900 by the transferor.

Signature of transferor:

I certify that the transferee, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this transfer in my presence.

Signature of witness:

Name of witness: See annexure A

Address of witness:

Certified correct for the purposes of the Real Property Act 1900 by the transferee.

Signature of transferee:

If signed on the transferee's behalf by a solicitor, licensed conveyancer or barrister, insert the signatory's full name and capacity below:

ALL HANDWRITING MUST BE IN BLOCK CAPITALS

T.F.B.

Sydney\004999978

ANNEXURE A TO TRANSFER

DATED:

THEO'S LIQUOR PTY LTD ACN 102 914 661 (TRANSFEROR)

COLES MYER PROPERTY DEVELOPMENTS LIMITED ACN 004 428 326

ITEM (A) TORRENS TITLE

✓783/804337 ✓
✓22/1/13225
✓26/1/13225
✓27/1/13255
✓29/1/13255
✓30/1/13225
✓45/1/13225
✓402/631754
✓3/A/2814, 2/A/2814, ~~4/A/2814, 5/A/2814~~
✓1/659919
✓Auto Consol 13700-6

R
K.F.B.

Executed by
Theo's Liquor Pty Ltd
by authority of its directors
in the presence of.
Authority: s127 of the Corporations Act 2001

K. F. Bennett

Secretary/Director

ROBERT FREDERICK BENNETT
Secretary

Name (please print)

Director

PETER ROBERT PATTERSON
Director

Name (please print)

Executed by
Coles Myer Property Developments Limited
by authority of its directors
in the presence of.
Authority: s127 of the Corporations Act 2001

K. F. Bennett

Secretary/Director

ROBERT FREDERICK BENNETT
Secretary

Name (please print)

Director

PETER ROBERT PATTERSON
Director

Name (please print)

LAND REGISTRY SERVICES

Direct Info
Quick and easy online

06/09/2021 05:25 PM

Form: 01T
Licence: 01-08-067
Licensee: Midware Systems

CLAYTON UTZ

TRANSFER

New South Wales
Real Property Act 19

AA147444N

PRIVACY NOTE: this information is legally required and

STAMP DUTY Office of State Revenue use only

NEW SOUTH WALES DUTY
02-10-2003 0001418388-002
SECTION 18(2)
DUTY $ **********2.00

(A) TORRENS TITLE If appropriate, specify the part transferred
Folio Identifier 402/631754

(B) LODGED BY

Delivery Box	Name, Address or DX and Telephone	CODE
~~27~~ ~~185H~~	CL~~AYTON UTZ~~ Freehills DX ~~370~~ SYDNEY Tel: ~~9353 4000~~ Reference (optional): ~~(3256667)~~ AGSN2: 80355578	T TW (Sheriff)

(C) TRANSFEROR KARLAUN PTY LIMITED, ABN 74 080 572 407

(D) CONSIDERATION The transferor acknowledges receipt of the consideration of $ 6,181,661.00 and as regards

(E) ESTATE the land specified above transfers to the transferee an estate in fee simple.

(F) SHARE TRANSFERRED

(G) Encumbrances (if applicable):

(H) TRANSFEREE PALLAS NEWCO PTY LIMITED, ACN 102 914 661

(I) TENANCY:

(J) DATE 14 / 05 / 03

See Annexure "A" for Transferor execution clause.

Certified correct for the purposes of the Real Property Act 1900 by the person whose signature appears below.

Signature:

Signatory's name:
Signatory's capacity: Solicitor for the transferee

ANDREW GRAEME STEELE
SOLICITOR

Annexure "A" to Transfer

Executed by **Karlaun Pty Limited, ABN 74 080 572 407** by or in the presence of:

THEO KAREDIS

(Name of sole Director and Secretary in full) who states that he or she is the sole Director and sole company Secretary of Karlaun Pty Limited

Signature

LAND REGISTRY SERVICES

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06/09/2021 05:27 PM

Form: 97-01TP
Licence: 27C/0042/95

TRANSFER

New South Wales
Real Property Act 1900

6807623L

Office of State Revenue use only

NEW SOUTH WALES DUTY
05-05-2000 0000298599-001
SECTION 18(2)
DUTY $ **********2.00

(A) **LAND TRANSFERRED**
If appropriate, specify the share transferred.

402 / 631754
401 / 631754

(B) **LODGED BY**

LTO Box	Name, Address or DX and Telephone
374	~~HS~~ WBC
	REFERENCE (15 character maximum): 9150283 MS.

(C) **TRANSFEROR** **PREMIUM WINE COMPANY PTY. LIMITED (ACN 002 130 949)**

(D) acknowledges receipt of the consideration of $8,500,000.00 and as regards the land specified above transfers to the transferee an estate in fee simple.

(E) Encumbrances (if applicable) 1. 2753711 (402/631754) 2. 3.

(F) **TRANSFEREE**

T	**KARLAUN PTY. LIMITED (ACN 080 572 407)**
TS (s713 LGA)	
TW (Sheriff)	~~TENANCY~~:

(G)

(H) We certify this dealing correct for the purposes of the Real Property Act 1900 **DATE**

Signed in my presence by the transferor who is personally known to me

The common seal of
Premium Wine Company Pty. Limited
is fixed to this document in the presence of:

PREMIUM WINE COMPANY PTY LIMITED A.C.N. 002 130 949 ★ Common Seal

Secretary/Director

D. P. MARLOW

Name (please print)

Director

H J NYCOC

Name (please print)

Signed in my presence by the transferee who is personally known to me

Signature of Witness

Name of Witness (BLOCK LETTERS)

Address of Witness

Thomas Owen Jones

Signature of Transferee's solicitor

If signed on the transferee's behalf by a solicitor or licensed conveyancer, show the signatory's full name in block letters

FREEHILL HOLLINGDALE & PAGE

FHPSYDCE\00369904.3

CHECKED BY (LTO use)

LAND REGISTRY SERVICES

Direct Info
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06/09/2021 05:19 PM

CERTIFICATE OF TITLE

NEW SOUTH WALES — REAL PROPERTY ACT, 1900

15061054

First Title : Old System
Prior Titles :

Vol. 4085 Fol. 8	Vol. 5709 Fol. 13
Vol. 5272 Fol.160	Vol. 6210 Fol.214
Vol. 5580 Fol. 4	Vol. 8410 Fol.118
Vol. 5704 Fol.101	Vol. 9944 Fol. 43

Vol. 15061 Fol. 54

EDITION 7 ISSUED 6 1983

I certify that the person named in the First Schedule is the registered proprietor of an estate in fee simple (or such other estate or interest as is set out below) in the land described subject to the recordings appearing in the Second Schedule and to the provisions of the Real Property Act, 1900.

CANCELLED

Registrar General.

Vol. 15061 Fol. 54 (Page 1)

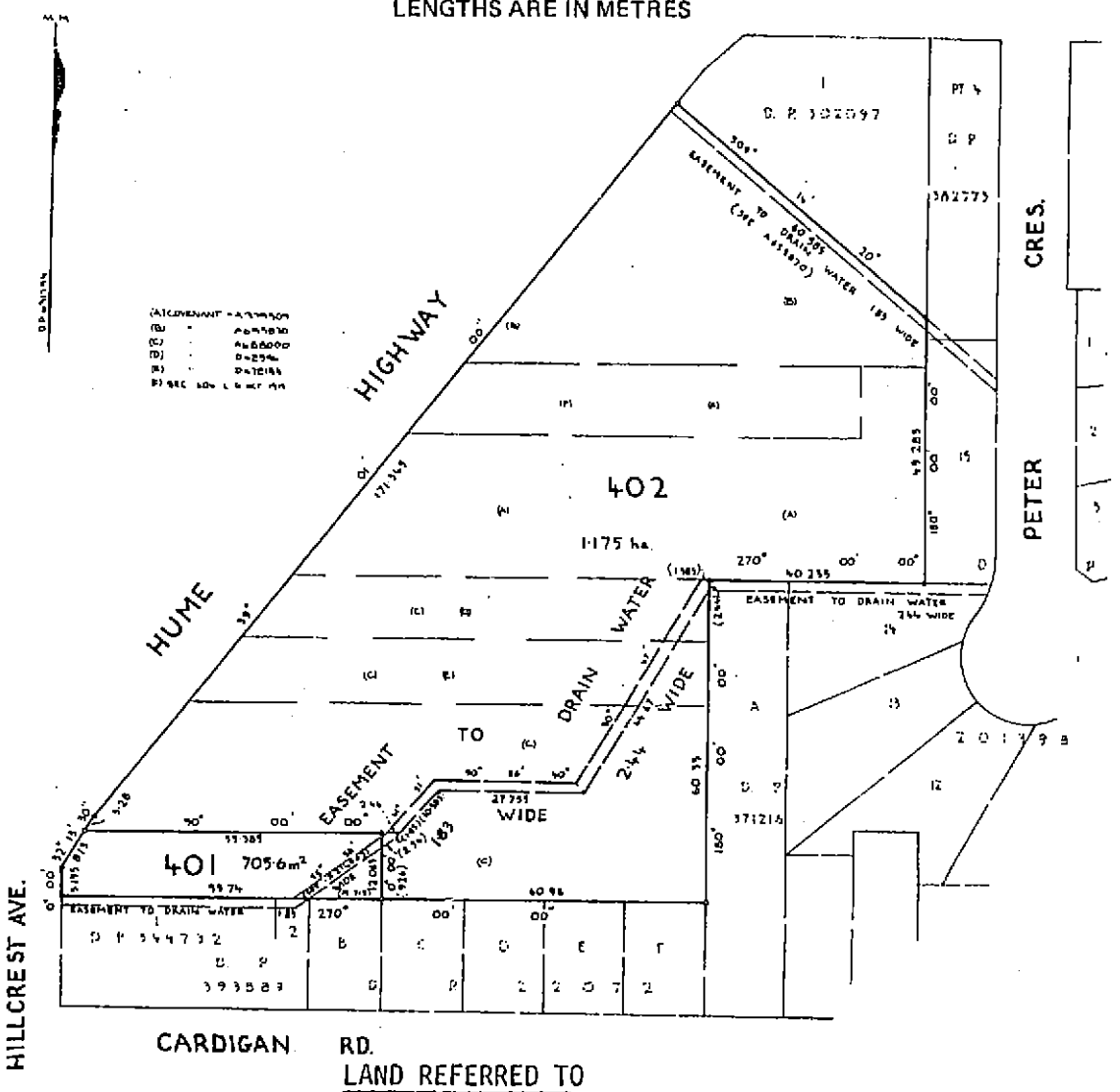
PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

PLAN SHOWING LOCATION OF LAND

SEE ALSO DP 631754

LENGTHS ARE IN METRES



LAND REFERRED TO

Lot 402 in Deposited Plan 631754 at Greenacre in the City of Bankstown Parish of Bankstown and County of Cumberland.

FIRST SCHEDULE

~~CECILIA ELLEN WALL as to that part of the land above described formerly comprised in Certificates of title Volume 4085 Folio 8, Volume 5272 Folio 160, Volume 5580 Folio 4, Volume 5709 Folio 13, Volume 6210 Folio 214, Volume 8410 Folio 118 and Volume 9944 Folio 43 and ANTONI DOMAGALA and ELFRIEDE DOMAGALA as joint tenants as to that part of the land above described formerly comprised in Certificate of Title Volume 5704 Folio 101.~~

SECOND SCHEDULE

GRY 1. Reservations and conditions, if any, contained in the Crown Grant.
CY 2. A379309 P Covenant affecting the land shown so burdened in the plan hereon.
CY 3. A653870 P Covenant affecting the land shown so burdened in the plan hereon.
ED(SB) 4. A653870 P Easement for drainage affecting the part of the land above described shown so burdened in the plan hereon.
CY 5. A688000 P Covenant affecting the land shown so burdened in the plan hereon.
CY 6. D42596 P Covenant affecting the land shown so burdened in the plan hereon.
CY 7. D472133 P Covenant affecting the land shown so burdened in the plan hereon.
8. The registered proprietors hold subject to section 604 Local Government Act,1919 as regards the land as indicated in the plan hereon.
EW(SB) 9. R214902 P Easement to drain water affecting the part of the land above described shown so burdened in the plan hereon.
EW EA(SB) 10. DP631754 P Easement to drain water 1.83 and 2.44 wide affecting the part of the land above described shown so burdened in Deposited Plan 631754.
11. ~~T307019~~ ~~Caveat by Cecilia Ellen Wall affecting that part of the land above described formerly comprised in Certificate of Title Volume 5704 Folio 101.~~ Withdrawn T629666

RG 2/64

L.O. 1066 D. West, Government Printer

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	Registrar General
~~Cecilia Ellen Wall by Transfer T583096. Registered 20-6-1983.~~	
Premium Wine Company Pty. Limited by Transfer W358693. Registered 12-6-1986.	

SECOND SCHEDULE (continued)

	PARTICULARS	Registrar General	CANCELLATION
	~~T629667 Mortgage to Partnership Pacific Limited. registered 21-7-1983~~		W358692
L	W28482P Lease to Totalizator Agency Board of premises being T.A.B. Building shown hatched in plan with W28482. Expires 31-7-1995 with an option of renewal 5 years. Registered 17-12-1985.		
	~~W336782 Caveat by Equitcorp Australia Limited. Registered 12-6-1986.~~		W384605
M	W384605P Mortgage to Equiticorp Australia Limited. Registered 7-7-1986		

CANCELLED

SEE AUTO FOLIO

NOTATIONS AND UNREGISTERED DEALINGS

T583096 DL
T629666 WX/
67 m/L
W28482 LR — f7 1995
W336782X
W358692 DH
— 37e
W384605 m L

LAND REGISTRY SERVICES

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09/09/2021 02:20 PM

Appn. No. 15263

Reference to last certificate,

Vol. 2847 Fol. 38

No.of Deposited Plan 6175

New South Wales.

[CERTIFICATE OF TITLE.]

ORDER NO.B 581505

RESIDUE AFTER TRANSFER NO.B 581504

REGISTER BOOK.

VOL. 4085 FOL. 8

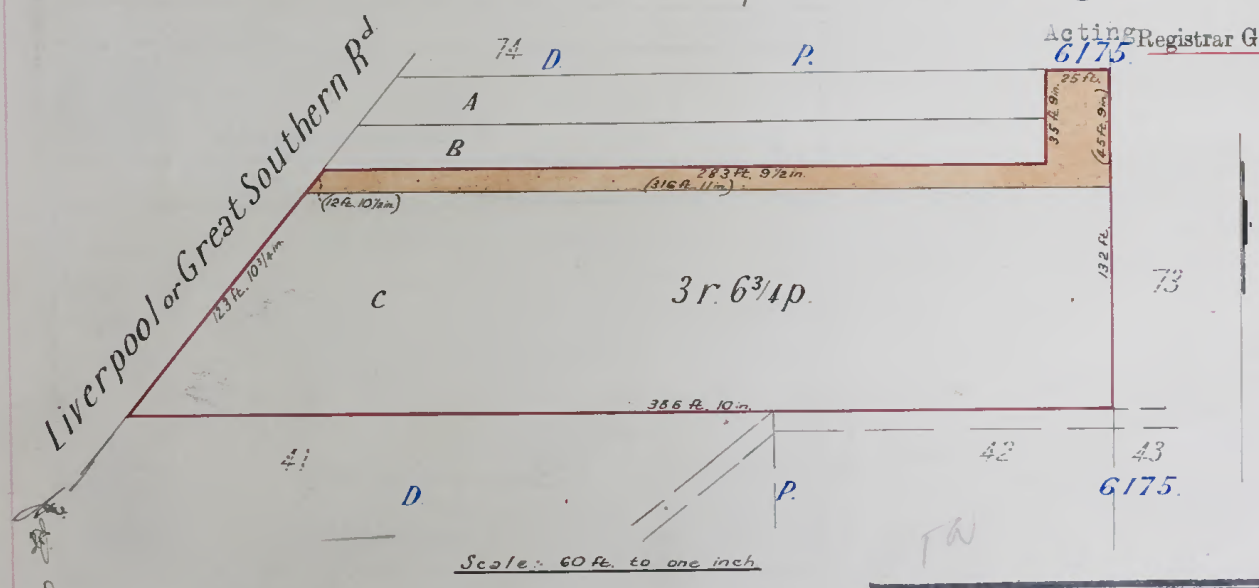
CANCELLED

MILDRED AMELIA SMITH of Bankstown, Widow, by virtue of Certificate of Title Volume 2847 Folio 38 now surrendered as to Residue after Transfer No.B 581504, is now the proprietor of an Estate in Fee Simple, subject nevertheless to the reservations and conditions, if any, contained in the Grant hereinafter referred to, and also subject to such encumbrances, liens, and interests as are notified hereon, in that piece of land situated in the Municipality of Bankstown Parish of Bankstown, and County of Cumberland containing Three roods six and three quarters perches or thereabouts as shown in the plan hereon and therein edged red being Lot C shown in plan annexed to the said Instrument of Transfer No.B 581504 and being part of 500 acres (Portion 6 of Parish) delineated in the Public Map of the said Parish in the Department of Lands originally granted to John Payne Lloyd by Crown Grant dated the 17th day of June 1831.

In witness whereof I have hereunto signed my name and affixed my Seal, this second day of December 1927.

Signed in the presence of R. McNay.

Acting Registrar General.



NOTIFICATION REFERRED TO

Instrument of Transfer No.A 379309 comprising inter alia the land above described contains a covenant by Thomas Henry Smith the transferee thereunder that he his heirs executors administrators and assigns shall not nor will at any time erect or permit or suffer to be erected on the land therein described any dwelling of less value than One hundred and fifty pounds (£150.0.0) and that on the erection of any such dwelling the said land shall be fenced and that no advertisement hoarding shall be erected on the said land.

Acting Registrar General.

No.B 581504 Grant of Right of Way Mildred Amelia Smith to Clifford Stuart Tanner over the piece of land colored brown in plan hereon.

Acting Registrar General.

Released T554575 16-5-1983

No. B 752568 APPLICATION BY TRANSMISSION

Henry Smith Salesman and Arthur John Smith Salesman both of Bankstown the registered Proprietors as joint tenants of the Land within described in pursuance of the above Application. Produced 29th November 1928 and entered 6th December 1928 at 4 o'clock in the afternoon.

REGISTRAR GENERAL

No. B 752569 CAVEAT dated 29th November 1928 by the Registrar General. Produced and entered 6th December 1928 at 4 o'clock in the afternoon.

REGISTRAR GENERAL

B 752568/9

D497635R

The within Caveat No. 3752569 is hereby withdrawn
Dated 20th June 1946.
J. Wells
REGISTRAR GENERAL.

No. D497635 TRANSFER dated 18th May 1946
from the said Henry Smith and Archer John Smith Clerk to William Veale of Chullora
of the land within described
Produced 22nd May 1946 and entered 20th June 1946
at 12 o'clock in the noon.
J. Wells
REGISTRAR GENERAL.

No. F230775 MORTGAGE dated 25th day May 1950
from the said William Veale to Commonwealth Bank of Australia
Produced and entered 30th day of May 1950
at 34 mts to 11. 10 o'clock in the fore noon.
J. Wells
REGISTRAR GENERAL

MORTGAGE No. F230775 has been discharged.
See H506921 Entered 17th June 1960.
Jawatson
REGISTRAR GENERAL.

No. H506922 MORTGAGE dated 25th May 1960
to The National Bank of Australasia Limited
Entered 17th June 1960
Jawatson
REGISTRAR GENERAL

MORTGAGE No. H506922 has been discharged
See J779397 Entered 6th October 1964
Jawatson
REGISTRAR GENERAL

John William Wall of Hurstville, Company Director is
now the registered proprietor of the land within described.
See TRANSFER No. J779398 dated 17th September 1964.
Entered 6th October 1964.
Jawatson
REGISTRAR GENERAL

No. M 114235 Caveat dated 30th November, 1970.
Registered 25th January, 1971.
Jawatson
Registrar General

No. M768543 Encumbrance dated 16th May 1972
to Tooth & Co. Limited with consent of Caveator
Entered 1st August 1972
Discharged T494426 23-4-1983
Jawatson
REGISTRAR GENERAL

No. M768544 ENCUMBRANCE dated 16th May 1972
to Tooth & Co. Limited with consent of Caveator
Entered 1st August 1972
Discharged T494425 23-4-1983
Jawatson
REGISTRAR GENERAL

No. M768545 MORTGAGE dated 16th May 1972
to Tooth & Co. Limited with consent of Caveator
Entered 1st August 1972
Discharged T494427 23-4-1983
Jawatson
REGISTRAR GENERAL

REGISTERED PROPRIETOR Cecilia Ellen Wall by transmission
T278509 Registered 30-10-1982
REGISTRAR GENERAL

This deed is cancelled as to Whole
New certificates of Title have issued on 3.6.1983
for lots in deposited Plan No 631754 as follows:
Lots 401-402 Vol 15061 Fol 53-54 respectively.
REGISTRAR GENERAL

APPENDIX E

CURRENT AND HISTORICAL AERIAL PHOTOGRAPHS

Aargus

HISTORICAL AERIAL PHOTOGRAPHS - 1943

N

LEGEND

Site Boundary

PROJECT DETAILS		DRAWING DETAILS			
Project Title	Detailed Site Investigation	**Figure No.**	1	**Rev No.**	0
Project No.	ES8338	**Scale**	NTS	**Size**	A3
Client	Iris Capital	**Drawn by**	SR	**Date**	06.09.2021
Site Address	167 Hume Highway, Greenacre NSW	**Approved by**	MK	**Date**	06.09.2021

Aargus

HISTORICAL AERIAL PHOTOGRAPHS - 1955

N

LEGEND

Site Boundary

PROJECT DETAILS		Aargus	**DRAWING DETAILS**			
Project Title	Detailed Site Investigation		**Figure No.**	2	**Rev No.**	0
Project No.	ES8338		**Scale**	NTS	**Size**	A3
Client	Iris Capital		**Drawn by**	SR	**Date**	06.09.2021
Site Address	167 Hume Highway, Greenacre NSW		**Approved by**	MK	**Date**	06.09.2021

HISTORICAL AERIAL PHOTOGRAPHS - 1971

N

LEGEND

Site Boundary

PROJECT DETAILS	
Project Title	Detailed Site Investigation
Project No.	ES8338
Client	Iris Capital
Site Address	167 Hume Highway, Greenacre NSW

Aargus

DRAWING DETAILS			
Figure No.	3	**Rev No.**	0
Scale	NTS	**Size**	A3
Drawn by	SR	**Date**	06.09.2021
Approved by	MK	**Date**	06.09.2021

HISTORICAL AERIAL PHOTOGRAPHS - 1975

N

LEGEND

Site Boundary

PROJECT DETAILS		DRAWING DETAILS			
Project Title	Detailed Site Investigation	**Figure No.**	4	**Rev No.**	0
Project No.	ES8338	**Scale**	NTS	**Size**	A3
Client	Iris Capital	**Drawn by**	SR	**Date**	06.09.2021
Site Address	167 Hume Highway, Greenacre NSW	**Approved by**	MK	**Date**	06.09.2021

Aargus

HISTORICAL AERIAL PHOTOGRAPHS - 1991

N

LEGEND

Site Boundary

PROJECT DETAILS	
Project Title	Detailed Site Investigation
Project No.	ES8338
Client	Iris Capital
Site Address	167 Hume Highway, Greenacre NSW

Aargus

DRAWING DETAILS			
Figure No.	5	**Rev No.**	0
Scale	NTS	**Size**	A3
Drawn by	SR	**Date**	06.09.2021
Approved by	MK	**Date**	06.09.2021

HISTORICAL AERIAL PHOTOGRAPHS - 1994

N

LEGEND

Site Boundary

PROJECT DETAILS		Aargus	**DRAWING DETAILS**			
Project Title	Detailed Site Investigation		**Figure No.**	6	**Rev No.**	0
Project No.	ES8338		**Scale**	NTS	**Size**	A3
Client	Iris Capital		**Drawn by**	SR	**Date**	06.09.2021
Site Address	167 Hume Highway, Greenacre NSW		**Approved by**	MK	**Date**	06.09.2021

HISTORICAL AERIAL PHOTOGRAPHS - 1998

N

LEGEND

Site Boundary

PROJECT DETAILS		DRAWING DETAILS			
Project Title	Detailed Site Investigation	**Figure No.**	7	**Rev No.**	0
Project No.	ES8338	**Scale**	NTS	**Size**	A3
Client	Iris Capital	**Drawn by**	SR	**Date**	06.09.2021
Site Address	167 Hume Highway, Greenacre NSW	**Approved by**	MK	**Date**	06.09.2021

Aargus

HISTORICAL AERIAL PHOTOGRAPHS - 2005

N

LEGEND

Site Boundary

PROJECT DETAILS	
Project Title	Detailed Site Investigation
Project No.	ES8338
Client	Iris Capital
Site Address	167 Hume Highway, Greenacre NSW

Aargus

DRAWING DETAILS			
Figure No.	8	**Rev No.**	0
Scale	NTS	**Size**	A3
Drawn by	SR	**Date**	06.09.2021
Approved by	MK	**Date**	06.09.2021

HISTORICAL AERIAL PHOTOGRAPHS - 2021

N

LEGEND

Site Boundary

PROJECT DETAILS		DRAWING DETAILS			
Project Title	Detailed Site Investigation	**Figure No.**	9	**Rev No.**	0
Project No.	ES8338	**Scale**	NTS	**Size**	A3
Client	Iris Capital	**Drawn by**	SR	**Date**	06.09.2021
Site Address	167 Hume Highway, Greenacre NSW	**Approved by**	MK	**Date**	06.09.2021

Aargus

APPENDIX F

NSW EPA RECORDS

Aargus

Search results

Your search for:LGA: CANTERBURY-BANKSTOWN COUNCIL

Matched 59 notices relating to 17 sites.

Search Again

Refine Search

Suburb	Address	Site Name	Notices related to this site
BASS HILL	862 Hume HIGHWAY	Woolworths Caltex Bass Hill	1 former
CAMPSIE	403 Canterbury Road and 1 Una STREET	Budget Petroleum and adjacent property	1 current
CAMPSIE	60 Charlotte STREET	Former Sunbeam factory	4 former
CANTERBURY	13-19 Canterbury ROAD	Metro Petroleum Service Station	2 current
CHESTER HILL	127 Orchard ROAD	Former Orica, Chester Hill	4 former
EARLWOOD	3 Jackson PLACE	RTA Land	2 current
HURLSTONE PARK	610 - 618 New Canterbury ROAD	Former Speedway Petroleum Service Station	3 former
PADSTOW	55 Bryant STREET	Former Exide Battery Manufacturing & Recycling	2 current and 1 former
PUNCHBOWL	42-44 Belmore ROAD	Punchbowl Laundry	3 current
REVESBY	21 Marigold STREET	Mirotone Pty Ltd	3 former
REVESBY	33-35 Violet STREET	Thetis Pty Ltd - Bituminous Products	3 current and 6 former
VILLAWOOD	2A Birmingham AVENUE	Ettason Villawood Site	2 current
VILLAWOOD	66 Christina ROAD	Former Electrical Component Manufacturer	1 current and 6 former
VILLAWOOD	2 Christina ROAD	Former Orica Crop Care	2 current and 2 former
VILLAWOOD	49 Miowera ROAD	Former Siemens/Westinghouse	9 former
VILLAWOOD	110A Christina ROAD	Nepotian (Former Toll) Site	1 current
YAGOONA	117-153 Rookwood ROAD	Galserv Galvanising Services	1 current

Page 1 of 1

31 August 2021

Search results

Your search for:Suburb: GREENACRE

Search Again
Refine Search

did not find any records in our database.

If a site does not appear on the record it may still be affected by contamination. For example:

- Contamination may be present but the site has not been regulated by the EPA under the Contaminated Land Management Act 1997 or the Environmentally Hazardous Chemicals Act 1985.
- The EPA may be regulating contamination at the site through a licence or notice under the Protection of the Environment Operations Act 1997 (POEO Act).
- Contamination at the site may be being managed under the planning process.

Search TIP

To search for a specific site, search by LGA (local government area) and carefully review all sites listed.

... more search tips

More information about particular sites may be available from:

- The POEO public register
- The appropriate planning authority: for example, on a planning certificate issued by the local council under section 149 of the Environmental Planning and Assessment Act.

See What's in the record and What's not in the record.

If you want to know whether a specific site has been the subject of notices issued by the EPA under the CLM Act, we suggest that you search by Local Government Area only and carefully review the sites that are listed.
This public record provides information about sites regulated by the EPA under the Contaminated Land Management Act 1997, including sites currently and previously regulated under the Environmentally Hazardous Chemicals Act 1985. Your inquiry using the above search criteria has not matched any record of current or former regulation. You should consider searching again using different criteria. The fact that a site does not appear on the record does not necessarily mean that it is not affected by contamination. The site may have been notified to the EPA but not yet assessed, or contamination may be present but the site is not yet being regulated by the EPA. Further information about particular sites may be available from the appropriate planning authority, for example, on a planning certificate issued by the local council under section 149 of the Environmental Planning and Assessment Act. In addition the EPA may be regulating contamination at the site through a licence under the Protection of the Environment Operations Act 1997. You may wish to search the POEO public register.POEO public register

31 August 2021

Number	Name	Location	Type	Status	Issued date
1580663	AUSSIE SKIPS RECYCLING PTY LTD	13 Bellfrog Street, GREENACRE, NSW 2190	s.55 Licence Refusal	Issued	5-Jul-19
21389	AUSSIE SKIPS RECYCLING PTY LTD	13 Bellfrog Street, GREENACRE, NSW 2190	POEO licence	Issued	4-Mar-20
1601731	AUSSIE SKIPS RECYCLING PTY LTD	13 Bellfrog Street, GREENACRE, NSW 2190	Compliance Audit	Complete	16-Oct-20
1609799	AUSSIE SKIPS RECYCLING PTY LTD	13 Bellfrog Street, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	8-Jul-21
745	BANKSTOWN CITY COUNCIL	BANKSIA ROAD, GREENACRE, NSW 2190	POEO licence	Surrendered	27-Apr-00
11520	BANKSTOWN CITY COUNCIL	1-3 Anzac Street, GREENACRE, NSW 2190	POEO licence	No longer in force	10-Oct-01
1011496	BANKSTOWN CITY COUNCIL	BANKSIA ROAD, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	19-Oct-01
1037963	BANKSTOWN CITY COUNCIL	1-3 Anzac Street, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	15-Jun-04
1044439	BANKSTOWN CITY COUNCIL	BANKSIA ROAD, GREENACRE, NSW 2190	s.80 Surrender of a Licence	Issued	15-Feb-05
11678	BITUPAVE LTD	1-5 NORFOLK ROAD, GREENACRE, NSW 2190	POEO licence	No longer in force	5-Jun-02
1018142	BITUPAVE LTD	1-5 NORFOLK ROAD, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	12-Jun-02
1018819	BITUPAVE LTD	1-5 NORFOLK ROAD, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	19-Sep-02
1024203	BITUPAVE LTD	1-5 NORFOLK ROAD, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	7-Feb-03
1033147	BITUPAVE LTD	1-5 NORFOLK ROAD, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	15-Dec-03
1034343	BITUPAVE LTD	1-5 NORFOLK ROAD, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	21-Apr-04
1046230	BITUPAVE LTD	1-5 NORFOLK ROAD, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	10-Jun-05
1053898	BITUPAVE LTD	1-5 NORFOLK ROAD, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	12-Dec-05
1068622	BITUPAVE LTD	1-5 NORFOLK ROAD, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	29-Mar-07
1098247	BITUPAVE LTD	1-5 NORFOLK ROAD, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	30-Mar-09
1103943	BITUPAVE LTD	1-5 NORFOLK ROAD, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	10-Jul-09
21429	BITUPAVE LTD	1-5 NORFOLK ROAD, GREENACRE, NSW 2190	POEO licence	Issued	8-Dec-20
20156	CLEANAWAY PTY LTD	44 CLAREMONT AVENUE, GREENACRE, NSW 2190	POEO licence	Issued	21-May-15
1533002	CLEANAWAY PTY LTD	44 CLAREMONT AVENUE, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	24-Aug-15
1564999	CLEANAWAY PTY LTD	44 CLAREMONT AVENUE, GREENACRE, NSW 2190	Compliance Audit	Complete	17-May-18
1603077	CLEANAWAY PTY LTD	44 CLAREMONT AVENUE, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	7-Dec-20
20847	GREENACRE RECYCLING PTY LTD	35 Wentworth Street, GREENACRE, NSW 2190	POEO licence	Issued	3-Mar-17
3173524081	GREENACRE RECYCLING PTY LTD	35 Wentworth Street, GREENACRE, NSW 2190	Penalty Notice	Issued	11-Jan-18
1564759	GREENACRE RECYCLING PTY LTD	35 Wentworth Street, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	7-Jun-18
1569832	GREENACRE RECYCLING PTY LTD	35 Wentworth Street, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	28-Sep-18
1577847	GREENACRE RECYCLING PTY LTD	35 Wentworth Street, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	29-Mar-19
3173530169	GREENACRE RECYCLING PTY LTD	35 Wentworth Street, GREENACRE, NSW 2190	Penalty Notice	Issued	18-Mar-21
1500439	H. HASSARATI & CO PTY LTD	35 Wentworth Street, GREENACRE, NSW 2190	s.91 Clean Up Notice	Issued	30-Aug-11
1540511	H. HASSARATI & CO PTY LTD	35 Wentworth Street, GREENACRE, NSW 2190	s.91 Clean Up Notice	Issued	26-May-16
3085779850	H. HASSARATI & CO PTY LTD	35 Wentworth Street, GREENACRE, NSW 2190	Penalty Notice	Issued	15-Aug-16
3085780437	H. HASSARATI & CO PTY LTD	35 Wentworth Street, GREENACRE, NSW 2190	Penalty Notice	Issued	21-Oct-16
1550305	H. HASSARATI & CO PTY LTD	35 Wentworth Street, GREENACRE, NSW 2190	s.110 Revocation of Clean Up Notice	Issued	17-Mar-17
1550041	H. HASSARATI & CO PTY LTD	35 Wentworth Street, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	30-Mar-17
1554599	H. HASSARATI & CO PTY LTD	35 Wentworth Street, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	28-Aug-17
20506	RENEW RUBBER PTY LIMITED	67 - 77 Beresford Avenue, GREENACRE, NSW 2190	POEO licence	Revoked	2-Apr-15
1532527	RENEW RUBBER PTY LIMITED	67 - 77 Beresford Avenue, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	25-Aug-15
3085779236	RENEW RUBBER PTY LIMITED	67 - 77 Beresford Avenue, GREENACRE, NSW 2190	Penalty Notice	Issued	1-Jun-16
1543246	RENEW RUBBER PTY LIMITED	67 - 77 Beresford Avenue, GREENACRE, NSW 2190	s.79 Revocation of a Licence	Issued	26-Aug-16
3070	VEOLIA ENVIRONMENTAL SERVICES (AUSTRALIA) PTY LTD	75 ANZAC STREET, GREENACRE, NSW 2190	POEO licence	Issued	31-May-00
1025262	VEOLIA ENVIRONMENTAL SERVICES (AUSTRALIA) PTY LTD	75 ANZAC STREET, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	31-Mar-03
1037674	VEOLIA ENVIRONMENTAL SERVICES (AUSTRALIA) PTY LTD	75 ANZAC STREET, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	11-Nov-04
1096010	VEOLIA ENVIRONMENTAL SERVICES (AUSTRALIA) PTY LTD	75 ANZAC STREET, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	22-Dec-08
1114401	VEOLIA ENVIRONMENTAL SERVICES (AUSTRALIA) PTY LTD	75 ANZAC STREET, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	1-Dec-10
1501617	VEOLIA ENVIRONMENTAL SERVICES (AUSTRALIA) PTY LTD	75 ANZAC STREET, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	13-Dec-11
1532587	VEOLIA ENVIRONMENTAL SERVICES (AUSTRALIA) PTY LTD	75 ANZAC STREET, GREENACRE, NSW 2190	s.58 Licence Variation	Issued	3-Sep-15
1564898	VEOLIA ENVIRONMENTAL SERVICES (AUSTRALIA) PTY LTD	75 ANZAC STREET, GREENACRE, NSW 2190	Compliance Audit	Complete	15-May-18

APPENDIX G

SECTION 149 CERTIFICATES

CITY OF CANTERBURY BANKSTOWN - BANKSTOWN BRANCH
ABN 45 985 891 846 Branch 004
Canterbury-Bankstown Council
PO Box 8 Bankstown NSW 1885
council@cbcity.nsw.gov.au

PLANNING CERTIFICATE

UNDER SECTION 149 (2) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

Info Track
DX 578
SYDNEY

CERTIFICATE DETAILS

NUMBER	20171596	**DATE**	26-Apr-2017

RECEIPT AND REFERENCE DETAILS

FEE	$220.00		
RECEIPT NUMBER	3585687	**RECEIPT DATE**	26-Apr-2017
REFERENCE	2016168:30637		

PROPERTY DESCRIPTION

PROPERTY	167 Hume Highway, GREENACRE NSW 2190		
TITLE	Lot 402 DP 631754		
PARISH	Bankstown	**COUNTY**	CUMBERLAND

PLANNING INSTRUMENTS

In accordance with Section 149(2) and at the date of this certificate the following Environmental Planning Instruments apply to the land.

Bankstown Local Environmental Plan 2015 Gazetted on 05-Mar-2015

LAND ZONING

B6 Enterprise Corridor

BANKSTOWN CUSTOMER SERVICE CENTRE
Upper Ground Floor, Civic Tower, 66-72 Rickard Road,
Bankstown NSW 2200, PO Box 8, Bankstown NSW 1885

CAMPSIE CUSTOMER SERVICE CENTRE
137 Beamish Street, Campsie NSW 2194
PO Box 77, Campsie NSW 2194

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SECTION 149(2) DETAILS

In accordance with section 149(2) of the Environmental Planning and Assessment Act 1979 (as amended) and at the date of this certificate, the following prescribed matters relate to the land.

1. NAMES OF RELEVANT PLANNING INSTRUMENTS AND DCPs

Affected by Bankstown Local Environmental Plan 2015 Amendments and Planning Proposals in respect of general information as detailed in Appendix 1.

Affected by State Environmental Planning Policies (SEPP's), Proposed State Environmental Planning Policies and Deemed State Environmental Planning Policies as detailed in Appendix 2.

Affected by Bankstown Development Control Plan 2015 (refer to Appendix 3 which lists the contents chapters within the DCP).

2. ZONING AND LAND USE UNDER RELEVANT LEPs

Unless specified otherwise in this section of the certificate, the land does not include or comprise critical habitat, is not in a conservation area and has no environmental heritage item on the land.

The purposes for which the plan or instrument provides that development may be carried out within the zone without the need for development consent are specified in clause 3.1 of the LEP 2015 plan and the land use table as detailed in Appendix 4. Reference should be made to the LEP 2015 plan as a whole for details.

The purposes for which the plan or instrument provides that development may not be carried out within the zone except with development consent are specified in Part 2 and clause 3.2 of the LEP 2015 plan and detailed in Appendix 4. Reference should be made to the LEP 2015 plan as a whole for details.

The purposes for which the plan or instrument provides that development is prohibited within the zone are specified in Part 2 and clauses 4.1A-2(c), 4.1B-2(4), 6.6 and 6.8 of the LEP 2015 plan and detailed in Appendix 4. Reference should be made to the LEP 2015 plan as a whole for details.

2A. ZONING AND LAND USE UNDER STATE ENVIRONMENTAL PLANNING POLICY (SYDNEY REGION GROWTH CENTRES) 2006

Unless specified otherwise in this section of the certificate, the land is not within any zone or land use under a Precinct Plan, a proposed Precinct Plan or Part 3 of State Environmental Planning Policy (Sydney Region Growth Centres) 2006.

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PLANNING CERTIFICATE

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3. COMPLYING DEVELOPMENT

General Housing Code

Complying development under the General Housing Code within "State Environmental Planning Policy (Exempt and Complying Development Codes) 2008" **may not** be carried out on the land.
The land is non complying because the land has been identified by an environmental planning instrument as being either one of the following zones:-

- B5 Business Development, B6 Enterprise Corridor, B7 Business Park
- IN1 General Industrial, IN2 Light Industrial
- SP1 Special Activities, SP2 Infrastructure
- RE1 Public Recreation, RE2 Private Recreation
- E1 National Park and Nature Reserves
- Land unzoned under LEP 2015……*refer to the Land Zoning of this certificate on page 1.*

OR
The land is affected by one or more of the following 4 exemptions:-

- A Heritage item …….. *refer to clause 2 of this certificate*,
- Land in the 25 or higher ANEF contour ……. *refer to clause 7 of this certificate,*
  (Unless the development is only for the erection of ancillary development, the alteration of or an addition to ancillary development or the alteration of a dwelling house)
- Acid sulfate soils class 1 or 2 …….. *refer to clause 7 of this certificate*,
- Land in a vegetated buffer area …….. *refer to clause 7 of this certificate*.

Note: If the land has been rendered non complying due to an exemption listed above, you are advised to check with Council for the extent of the exemption. The Code may render the land complying for any land which is outside the extent of the exemption. Reference should be made to the "Planning Maps" on Council's website www.bankstown.nsw.gov.au which identifies the land exemptions.

Housing Alterations Code

Complying development under the Housing Alterations Code within the provisions of "State Environmental Planning Policy (Exempt and Complying Development Codes) 2008" **may not** be carried out on the land.
The land is non complying because the land has been identified by an environmental planning instrument as being either one of the following zones:-

- B5 Business Development, B6 Enterprise Corridor, B7 Business Park
- IN1 General Industrial, IN2 Light Industrial
- SP1 Special Activities, SP2 Infrastructure
- RE1 Public Recreation, RE2 Private Recreation
- E1 National Park and Nature Reserves
- Land unzoned under LEP 2015……*refer to the Land Zoning of this certificate on page 1.*

OR
The land is affected by the following exemption:-

- A Heritage item ……*refer to clause 2 of this certificate.*

Note: If the land has been rendered non complying due to an exemption listed above, you are advised to check with Council for the extent of the exemption. The Code may render the land complying for any land which is outside the extent of the exemption. Reference should be made to the "Planning Maps" on Council's website www.bankstown.nsw.gov.au which identifies the land exemptions.

Subdivisions Code (strata subdivision)

Complying development under the Subdivisions Code within "State Environmental Planning Policy (Exempt and Complying Development Codes) 2008" **may** be carried out on the land.

Rural Housing Code

Complying development under the Rural Housing Code within "State Environmental Planning Policy (Exempt and Complying Development Codes) 2008" **may not** be carried out on the land.
The land is non complying because the land has been identified by an environmental planning instrument as being either one of the following zones:-

- R2 Low Density Residential, R3 Medium Density Residential, R4 High Density Residential
- B1 Neighbourhood Centre, B2 Local Centre, B4 Mixed Use, B5 Business Development, B6 Enterprise Corridor, B7 Business Park
- IN1 General Industrial, IN2 Light Industrial
- SP1 Special Activities, SP2 Infrastructure
- RE1 Public Recreation, RE2 Private Recreation
- E1 National Park and Nature Reserves
- Land unzoned under LEP 2015……*refer to the Land Zoning of this certificate on page 1.*

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OR

The land is affected by one or more of the following 4 exemptions:-

- A Heritage item …….. *refer to clause 2 of this certificate*,
- Land in the 25 or higher ANEF contour…. …… *refer to clause 7 of this certificate,*

(Unless the development is only for the erection of ancillary development, the alteration of or an addition to ancillary development or the alteration of a dwelling house)

- Acid sulfate soils class 1 or 2 …….. *refer to clause 7 of this certificate*,
- Land in a vegetated buffer area …….. *refer to clause 7 of this certificate*,

Note: If the land has been rendered non complying due to an exemption listed above, you are advised to check with Council for the extent of the exemption. The Code may render the land complying for any land which is outside the extent of the exemption. Reference should be made to the "Planning Maps" on Council's website www.bankstown.nsw.gov.au which identifies the land exemptions.

General Development Code

Complying development under the General Development Code within "State Environmental Planning Policy (Exempt and Complying Development Codes) 2008" **may** be carried out on the land.

Demolition Code

Complying development under the Demolition Code within "State Environmental Planning Policy (Exempt and Complying Development Codes) 2008" **may** be carried out on the land.

Fire Safety Code

Complying development under the Fire Safety Code within "State Environmental Planning Policy (Exempt and Complying Development Codes) 2008" **may** be carried out on the land.

Commercial and Industrial Alterations Code

Complying development under the Commercial and Industrial Alterations Code within the provisions of "State Environmental Planning Policy (Exempt and Complying Development Codes) 2008" **may not** be carried out on the land.

The land is non complying because the land has been identified by an environmental planning instrument as being either one of the following zones:-

- RU4 Primary Production Small Lots
- R2 Low Density Residential, R3 Medium Density Residential, R4 High Density Residential
- SP1 Special Activities, SP2 Infrastructure
- RE1 Public Recreation, RE2 Private Recreation
- E1 National Park and Nature Reserves
- Land unzoned under LEP 2015……*refer to the Land Zoning of this certificate on page 1*.

OR

The land is affected by one of the following exemptions:-

- A Heritage item …….. *refer to clause 2 of this certificate.*
- A Flood Control Lot .....*refer to clause 7A of this certificate.*

Note: If the land has been rendered non complying due to an exemption listed above, you are advised to check with Council for the extent of the exemption. The Code may render the land complying for any land which is outside the extent of the exemption. Reference should be made to the "Planning Maps" on Council's website www.bankstown.nsw.gov.au which identifies the land exemptions.

Further: Although the land is non complying for Subdivisions 9 & 10, the Code may render the land complying for Subdivisions 1-8 and 11-12. Reference should be made to "Part 5 – Commercial and Industrial Alterations Code" of the SEPP for details.

Commercial and Industrial (New Buildings and Additions) Code

Complying development under the Commercial and Industrial (New Buildings and Additions) Code within the provisions of "State Environmental Planning Policy (Exempt and Complying Development Codes) 2008" **may** be carried out on the land.

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PLANNING CERTIFICATE

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4. COASTAL PROTECTION

Unless specified otherwise in this section of the certificate, the land is not affected by the operation of Section 38 or 39 of the Coastal Protection Act 1979.

4A. CERTAIN INFORMATION RELATING TO BEACHES AND COASTS

Unless specified otherwise in this section of the certificate, the land is not subject to an order under Part 4D of the Coastal Protection Act 1979 in relation to temporary coastal protection works (or on public land adjacent to the land) and, Council has not been notified under Section 55X of the Coastal Protection Act 1979 that temporary coastal protection works have been placed on the land (or on public land adjacent to the land).

4B. ANNUAL CHARGES UNDER LOCAL GOVERNMENT ACT 1993 FOR COASTAL PROTECTION SERVICES THAT RELATE TO EXISTING COASTAL PROTECTION WORKS

Unless specified otherwise in this section of the certificate, the owner (or any previous owner) has not consented in writing that the land is subject to annual charges under Section 496B of the Local Government Act 1993 for coastal protection services that relate to existing coastal protection works.

5. MINE SUBSIDENCE

Not affected by Section 15 of the Mine Subsidence Compensation Act 1961, proclaiming land to be a mine subsidence district.

6. ROAD WIDENING AND REALIGNMENT

Not affected by any road widening or road realignment under (1) Division 2 of Part 3 of the Roads Act 1993; or (2) any Environmental Planning Instrument; or (3) any resolution of Council. However, the property fronts an existing or proposed arterial/main road. Please check with the Roads and Maritime Services for possible effects.

7. COUNCIL AND OTHER PUBLIC AUTHORITY POLICIES ON HAZARD RISK RESTRICTIONS

Unless specified otherwise in this section of the certificate, the land is not affected by policies adopted by Council or by any other authority (that has notified Council of its adoption) that restricts development of the land. For bush fire prone land refer to section 11. For flood prone land refer to section 7A.

Affected by a resolution of Council adopting a policy concerning the management of contaminated land. That policy applies to all land in the City of Canterbury-Bankstown and will restrict development of the land if the circumstances set out in the policy prevail. A copy of the policy is available on Council's website at www.bankstown.nsw.gov.au or from the Customer Service Area.

Note: Additional information regarding contaminated land matters for this property may also be provided on part 5 of this section 149 planning certificate. For further information contact Council on 9707 9000.

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PLANNING CERTIFICATE

UNDER SECTION 149 (2) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

7A. FLOOD RELATED DEVELOPMENT CONTROLS INFORMATION

Unless specified otherwise in this section of the certificate, the land is not affected by flood related development controls.

A Flood control lot.
The property is affected by a policy known as Bankstown Development Control Plan 2015, Part B12 - Flood Risk Management and clause 6.3 – Flood planning of the LEP 2015, by reference to the Greenacre Park Catchment Flood Modelling Report (December 2009) (a copy of which is available for inspection at Council's Offices), which categorises land affected by the 100 year flood into two flood risk precincts:

- High flood risk precinct – Land below the 100 year flood that is either subject to a high hydraulic hazard or where there are significant evacuation difficulties; and
- Medium flood risk precinct - Land below the 100 year flood that is not subject to a high hydraulic hazard and where there are no evacuation difficulties.

Bankstown Development Control Plan 2015 includes flood related development controls for properties based on the relevant flood risk precinct. Contact Council for information about the flood risk precinct applying to this property.

8. LAND RESERVED FOR ACQUISITION

Not affected by either an Environmental Planning Instrument or proposed Environmental Planning Instrument referred to in clause 5.1 providing for the acquisition of the land or part of the land by a public authority, as referred to in Section 27 of the Environmental Planning & Assessment Act. Reference should be made to the LEP 2015 plan as a whole for details.

9. CONTRIBUTION PLANS

Affected by Bankstown City Council Section 94A Development Contributions Plan 2009 which allows Council to impose a levy on development within the City of Canterbury-Bankstown in accordance with Directions issued by the Minister for Planning. The levy will be spent on the provision of public works and infrastructure. Date of commencement 8th June 2009. For further details on the plan contact Council on 9707 9000 or visit Council's website – www.bankstown.nsw.gov.au

9A. BIODIVERSITY CERTIFIED LAND

Unless specified otherwise in this section of the certificate, the land is not biodiversity certified land within the meaning of Part 7AA of the Threatened Species Conservation Act 1995.

10. BIOBANKING AGREEMENTS

Unless specified otherwise in this section of the certificate, the land is not subject to a Biobanking Agreement under Part 7A of the Threatened Species Conservation Act 1995, made by the Department of Environment, Climate Change and Water that has notified Council of the existence of the agreement.

11. BUSHFIRE PRONE LAND

Unless specified otherwise in this section of the certificate, the land is not bushfire prone.

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12. PROPERTY VEGETATION PLANS

Unless specified otherwise in this section of the certificate, the land is not subject to a Property Vegetation Plan under the Native Vegetation Act 2003, as approved by any other authority that has notified Council of the existence of the plan.

13. ORDERS UNDER TREES (DISPUTES BETWEEN NEIGHBOURS) ACT 2006

Unless specified otherwise in this section of the certificate, the land is not subject to a Tree Order under the Trees (Disputes Between Neighbours) Act 2006, made by an authority that has notified Council of the existence of the order.

14. DIRECTIONS UNDER PART 3A

Unless specified otherwise in this section of the certificate, the land is not subject to a Direction by the Minister under section 75P (2) (c1) of the Act that a provision of an EPI does not have an effect.

15. CONDITIONS AFFECTING SENIORS HOUSING

Unless specified otherwise in this section of the certificate, the land is not subject to a development application granted after 12.10.2007 under SEPP (Housing for Seniors or People with a Disability) 2004 setting out the terms of any conditions imposed under clause 18(2) or a current site compatibility certificate issued under clause 25 of the SEPP.

16. SITE COMPATIBILITY CERTIFICATES FOR INFRASTRUCTURE

Unless specified otherwise in this section of the certificate, the land is not subject to a development application under clause 19 of SEPP (Infrastructure) 2007 where a valid site compatibility certificate has been issued.

17. SITE COMPATIBILITY CERTIFICATES & CONDITIONS FOR AFFORDABLE RENTAL HOUSING

Unless specified otherwise in this section of the certificate, the land is not subject to a development application under SEPP (Affordable Rental Housing) 2009 where a valid site compatibility certificate and conditions have been issued.

18. PAPER SUBDIVISION INFORMATION

Unless specified otherwise in this section of the certificate, the land is not subject to a paper subdivision or subdivision order.

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19. SITE VERIFICATION CERTIFICATES

Unless specified otherwise in this section of the certificate, the land is not subject to a current site verification certificate of which the Council is aware in respect to Division 3 of Part 4AA of State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

20. LOOSE–FILL ASBESTOS INSULATION

A residential dwelling erected on this land has not been identified in the Loose–Fill Asbestos Insulation Register as containing loose–fill ceiling insulation. Contact NSW Fair Trading for more information.

MATTERS ARISING UNDER THE CONTAMINATED LAND MANAGEMENT ACT, 1997

Unless specified otherwise in this section of the certificate, there are no matters arising under Section 59(2) of the Contaminated Land Management Act 1997.

MATTERS ARISING UNDER THE NATION BUILDING AND JOBS PLAN (STATE INFRASTRUCTURE DELIVERY) ACT, 2009

Unless specified otherwise in this section of the certificate, there are no matters arising under Section 26 of the Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009.

This completes the prescribed matters for the certificate under section 149(2) of the Environmental Planning and Assessment Act 1979, as amended. While this certificate indicates the zoning of the land, it is suggested that the relevant Planning Instrument be inspected on Council's website under Development – Planning Maps or at Council's Customer Service Centre to provide an overall view of the area and the site's surrounding zonings.

Please contact Council's general enquiries number listed at the bottom of this sheet for further information about any matter referred to in this certificate.

M. Ratkun

Melissa Ratkun
Manager Information Management

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Appendix 1

Bankstown Local Environmental Plan 2015 Amendments & Planning Proposals.

(relating to general information only which may affect part or the whole of the City)

Note: As of 1 July 2009, Draft LEP's have been replaced with "Planning Proposals". A planning proposal is a document that explains the intended effect of, and justification for, a proposed LEP.

Nil

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Appendix 2

State Environmental Planning Policies (SEPP's), Proposed SEPP's and Deemed SEPP's

Note: The names of the relevant instrument's plus their gazettal dates are listed below. For further details please refer to the Department of Planning website www.planning.nsw.gov.au under the heading "Planning System – Legislation and Planning Instruments".

SEPP No.19 – Bushland in Urban Areas, gazetted 24.10.1986
SEPP No.21 – Caravan Parks, gazetted 24.4.1992
SEPP No.30 – Intensive Agriculture, gazetted 8.12.1989
SEPP No.32 – Urban Consolidation (Redevelopment of Urban Land), gazetted 15.11.1991
SEPP No.33 – Hazardous and Offensive Development, gazetted 13.3.1992
SEPP No.50 – Canal Estate Development, gazetted 10.11.1997
SEPP No.55 – Remediation of Land, gazetted 28.8.1998
SEPP No.62 – Sustainable Aquaculture, gazetted 25.8.2000
SEPP No.64 – Advertising and Signage, gazetted 16.3.2001
SEPP No.65 – Design Quality of Residential Flat Development, gazetted 26.7.2002
SEPP – (Housing for Seniors or People with a Disability) 2004, gazetted 31.3.2004
SEPP – (Building Sustainability Index: BASIX) 2004, gazetted 25.6.2004
SEPP – (Major Development) 2005, gazetted 1.8.2005
SEPP – (Mining, Petroleum Production and Extractive Industries) 2007, gazetted 16.2.2007
SEPP – (Miscellaneous Consent Provisions) 2007, gazetted 26.10.2007
SEPP – (Infrastructure) 2007, gazetted 21.12.2007
SEPP – (Exempt and Complying Development Codes) 2008, gazetted 12.12.2008
SEPP – (Affordable Rental Housing) 2009, gazetted 31.7.2009
SEPP – (Sydney Drinking Water Catchment) 2011, gazetted 21.1.2011

PROPOSED SEPP - Competition SEPP, 27.7.2010

Note: As of 1 July 2009, regional environmental plans (REPs) are no longer part of the hierarchy of environmental planning instruments in NSW. The removal of the REP layer is intended to simplify the State's planning system. All existing REPs (listed below) are now deemed State environmental planning policies (SEPPs).

Deemed SEPP – Greater Metropolitan Regional Environmental Plan No. 2 – Georges River Catchment, gazetted 5.2.1999

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Appendix 3

Bankstown Development Control Plan 2015

DATE OF COMMENCEMENT – 13th May 2015

The following is a list of the contents within Bankstown Development Control Plan 2015. If further information is required please contact Council on 9707 9000.

INTRODUCTION	
PART A	**PRECINCT CONTROLS**
A1	Centres
A2	Corridors
A3	Key infill development sites
PART B	**GENERAL CONTROLS**
B1	Residential development
B2	Commercial centres
B3	Industrial precincts
B4	Sustainable development
B5	Parking
B6	Child care centres
B7	Educational establishments
B8	Places of public worship
B9	Sex services premises
B10	Telecommunications facilities
B11	Tree preservation order
B12	Flood risk management

Please note: Council may from time to time exhibit draft changes to the development control plan that may affect your land. To find out more, please contact Council on 9707 9000 or view Council's website and refer to the Development Control Plan - www.bankstown.nsw.gov.au

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Appendix 4

Land Use Table

Note. A type of development referred to in the Land Use Table is a reference to that type of development only to the extent it is not regulated by an applicable State environmental planning policy. The following State environmental planning policies in particular may be relevant to development on land to which this Plan applies:
State Environmental Planning Policy (Affordable Rental Housing) 2009 (including provision for secondary dwellings)
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004
State Environmental Planning Policy (Infrastructure) 2007 (relating to public facilities such as those for air transport, correction, education, electricity generation, health services, ports, railways, roads, waste management and water supply systems)
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007
State Environmental Planning Policy (Rural Lands) 2008
State Environmental Planning Policy No 33—Hazardous and Offensive Development
State Environmental Planning Policy No 50—Canal Estate Development
State Environmental Planning Policy No 62—Sustainable Aquaculture
State Environmental Planning Policy No 64—Advertising and Signage

Zone RU4 Primary Production Small Lots
Permitted without consent Home occupations
Permitted with consent Agriculture; Animal boarding or training establishments; Building identification signs; Business identification signs; Dwelling houses; Environmental facilities; Environmental protection works; Extensive agriculture; Farm buildings; Flood mitigation works; Intensive plant agriculture; Kiosks; Plant nurseries; Recreation areas; Recreation facilities (indoor); Recreation facilities (outdoor); Roads; Roadside stalls; Water supply systems
Prohibited Any development not specified in item 2 or 3

Zone R2 Low Density Residential
Permitted without consent Home occupations
Permitted with consent Bed and breakfast accommodation; Boarding houses; Boat sheds; Building identification signs; Business identification signs; Car parks; Child care centres; Community facilities; Dual occupancies; Dwelling houses; Emergency services facilities; Environmental facilities; Environmental protection works; Exhibition homes; Flood mitigation works; Group homes; Health consulting rooms; Home-based child care; Hospitals; Information and education facilities; Jetties; Multi dwelling housing; Places of public worship; Public administration buildings; Recreation areas; Respite day care centres; Roads; Secondary dwellings; Semi-detached dwellings; Seniors housing; Water recreation structures; Water supply systems
Prohibited Any development not specified in item 2 or 3

Zone R3 Medium Density Residential
Permitted without consent Nil
Permitted with consent Attached dwellings; Bed and breakfast accommodation; Boarding houses; Building identification signs; Business identification signs; Car parks; Child care centres; Community facilities; Dwelling houses; Emergency services facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Group homes; Information and education facilities; Multi dwelling housing; Neighbourhood shops; Places of public worship; Public administration buildings; Recreation areas; Respite day care centres; Roads; Secondary dwellings; Seniors housing; Water supply systems
Prohibited Any development not specified in item 2 or 3

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Zone R4 High Density Residential
Permitted without consent Nil
Permitted with consent Attached dwellings; Bed and breakfast accommodation; Boarding houses; Building identification signs; Business identification signs; Car parks; Child care centres; Community facilities; Dwelling houses; Emergency services facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Information and education facilities; Multi dwelling housing; Neighbourhood shops; Places of public worship; Public administration buildings; Recreation areas; Residential flat buildings; Respite day care centres; Roads; Secondary dwellings; Seniors housing; Serviced apartments; Shop top housing; Water supply systems
Prohibited Any development not specified in item 2 or 3

Zone B1 Neighbourhood Centre
Permitted without consent Nil
Permitted with consent Boarding houses; Building identification signs; Bulky goods premises; Business identification signs; Business premises; Car parks; Child care centres; Community facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Garden centres; Hardware and building supplies; Health services facilities; Information and education facilities; Kiosks; Landscaping material supplies; Markets; Medical centres; Neighbourhood shops; Office premises; Places of public worship; Plant nurseries; Public administration buildings; Recreation areas; Recreation facilities (indoor); Recreation facilities (outdoor); Registered clubs; Research stations; Residential flat buildings; Respite day care centres; Restaurants or cafes; Roads; Seniors housing; Service stations; Shop top housing; Shops; Take away food and drink premises; Timber yards; Tourist and visitor accommodation; Vehicle repair stations; Vehicle sales or hire premises; Veterinary hospitals; Water supply systems
Prohibited Any development not specified in item 2 or 3

Zone B2 Local Centre
Permitted without consent Nil
Permitted with consent Boarding houses; Building identification signs; Business identification signs; Child care centres; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Function centres; Information and education facilities; Medical centres; Passenger transport facilities; Recreation facilities (indoor); Registered clubs; Residential flat buildings; Respite day care centres; Restricted premises; Roads; Seniors housing; Service stations; Shop top housing; Tourist and visitor accommodation; Any other development not specified in item 2 or 4
Prohibited Agriculture; Air transport facilities; Airstrips; Animal boarding or training establishments; Biosolids treatment facilities; Boat building and repair facilities; Boat launching ramps; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Exhibition homes; Exhibition villages; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Heavy industrial storage establishments; Helipads; Highway service centres; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Industries; Jetties; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Port facilities; Residential accommodation; Rural industries; Sewage treatment plants; Sex services premises; Signage; Storage premises; Transport depots; Truck depots; Vehicle body repair workshops; Waste or resource management facilities; Water recreation structures; Water recycling facilities; Wharf or boating facilities; Wholesale supplies

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Zone B4 Mixed Use
Permitted without consent Nil
Permitted with consent Boarding houses; Building identification signs; Business identification signs; Child care centres; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Function centres; Hotel or motel accommodation; Information and education facilities; Medical centres; Passenger transport facilities; Recreation facilities (indoor); Registered clubs; Residential flat buildings; Respite day care centres; Restricted premises; Roads; Seniors housing; Shop top housing; Any other development not specified in item 2 or 4
Prohibited Agriculture; Air transport facilities; Airstrips; Animal boarding or training establishments; Biosolids treatment facilities; Boat building and repair facilities; Boat launching ramps; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Exhibition homes; Exhibition villages; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Heavy industrial storage establishments; Highway service centres; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Industries; Jetties; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Port facilities; Residential accommodation; Resource recovery facilities; Rural industries; Sewage treatment plants; Sex services premises; Signage; Storage premises; Transport depots; Truck depots; Vehicle body repair workshops; Warehouse and distribution centres; Waste disposal facilities; Water recreation structures; Water recycling facilities; Wharf or boating facilities; Wholesale supplies

Zone B5 Business Development
Permitted without consent Nil
Permitted with consent Building identification signs; Bulky goods premises; Business identification signs; Business premises; Child care centres; Food and drink premises; Garden centres; Hardware and building supplies; Hotel or motel accommodation; Kiosks; Landscaping material supplies; Markets; Neighbourhood shops; Office premises; Passenger transport facilities; Plant nurseries; Respite day care centres; Roads; Serviced apartments; Timber yards; Vehicle sales or hire premises; Warehouse or distribution centres; Any other development not specified in item 2 or 4
Prohibited Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Biosolids treatment facilities; Boat building and repair facilities; Boat launching ramps; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Commercial premises; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Exhibition homes; Exhibition villages; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Heavy industrial storage establishments; Helipads; Home occupations (sex services); Industries; Jetties; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Port facilities; Residential accommodation; Resource recovery facilities; Restricted premises; Rural industries; Sewage treatment plants; Sex services premises; Signage; Storage premises; Tourist and visitor accommodation; Transport depots; Truck depots; Vehicle body repair workshops; Waste disposal facilities; Water recreation structures; Water recycling facilities; Wharf or boating facilities; Wholesale supplies

Zone B6 Enterprise Corridor
Permitted without consent Nil
Permitted with consent Building identification signs; Bulky goods premises; Business identification signs; Business premises; Community facilities; Food and drink premises; Garden centres; Hardware and building supplies; Hotel or motel accommodation; Kiosks; Landscaping material supplies; Light industries; Markets; Multi dwelling housing; Neighbourhood shops; Office premises; Passenger transport facilities; Plant nurseries; Residential flat buildings; Roads; Seniors housing; Timber yards; Vehicle sales or hire premises; Warehouse or distribution centres; Any other development not specified in item 2 or 4
Prohibited Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Biosolids treatment facilities; Boat building and repair facilities; Boat launching ramps; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Commercial premises; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Exhibition homes; Exhibition villages; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Heavy industrial storage establishments; Helipads; Home occupations (sex services); Industries; Jetties; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Port facilities; Residential accommodation; Resource recovery facilities; Restricted premises; Rural industries; Sewage treatment plants; Sex services premises; Signage; Storage premises; Transport depots; Truck depots; Vehicle body repair workshops; Waste disposal facilities; Water recreation structures; Water recycling facilities; Wharf or boating facilities; Wholesale supplies

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Zone B7 Business Park
Permitted without consent Nil
Permitted with consent Building identification signs; Business identification signs; Child care centres; Light industries; Neighbourhood shops; Office premises; Passenger transport facilities; Respite day care centres; Roads; Warehouse or distribution centres; Any other development not specified in item 2 or 4
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Zone IN1 General Industrial
Permitted without consent Nil
Permitted with consent Agricultural produce industries; Building identification signs; Business identification signs; Depots; Food and drink premises; Freight transport facilities; Garden centres; General industries; Hardware and building supplies; Hospitals; Industrial training facilities; Kiosks; Landscaping material supplies; Light industries; Markets; Medical centres; Neighbourhood shops; Plant nurseries; Roads; Timber yards; Vehicle sales or hire premises; Warehouse or distribution centres; Any other development not specified in item 2 or 4
Prohibited Agriculture; Air transport facilities; Airstrips; Amusement centres; Biosolids treatment facilities; Boat launching ramps; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Child care centres; Commercial premises; Eco-tourist facilities; Entertainment facilities; Exhibition homes; Exhibition villages; Extractive industries; Farm buildings; Forestry; Function centres; Health services facilities; Heavy industrial storage establishments; Home occupations (sex services); Industries; Jetties; Marinas; Mooring pens; Moorings; Open cut mining; Port facilities; Residential accommodation; Respite day care centres; Restricted premises; Rural industries; Schools; Sewage treatment plants; Signage; Tourist and visitor accommodation; Water recreation structures; Water recycling facilities; Wharf or boating facilities; Wholesale supplies

Zone IN2 Light Industrial
Permitted without consent Nil
Permitted with consent Agricultural produce industries; Building identification signs; Business identification signs; Depots; Food and drink premises; Garden centres; Hardware and building supplies; Hospitals; Industrial training facilities; Kiosks; Landscaping material supplies; Light industries; Markets; Medical centres; Neighbourhood shops; Plant nurseries; Roads; Timber yards; Vehicle sales or hire premises; Warehouse or distribution centres; Any other development not specified in item 2 or 4
Prohibited Agriculture; Air transport facilities; Airstrips; Amusement centres; Biosolids treatment facilities; Boat launching ramps; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Child care centres; Commercial premises; Correctional centres; Crematoria; Eco-tourist facilities; Entertainment facilities; Exhibition homes; Exhibition villages; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Function centres; Health services facilities; Heavy industrial storage establishments; Helipads; Highway service centres; Home occupations (sex services); Industries; Jetties; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Port facilities; Recreation facilities (major); Residential accommodation; Resource recovery facilities; Respite day care centres; Restricted premises; Rural industries; Schools; Sewage treatment plants; Signage; Tourist and visitor accommodation; Transport depots; Truck depots; Waste disposal facilities; Water recreation structures; Water recycling facilities; Wharf or boating facilities; Wholesale supplies

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Zone SP1 Special Activities
Permitted without consent Nil
Permitted with consent The purpose shown on the Land Zoning Map, including any development that is ordinarily incidental or ancillary to development for that purpose
Prohibited Any development not specified in item 2 or 3

Zone SP2 Infrastructure
Permitted without consent Nil
Permitted with consent Roads; The purpose shown on the Land Zoning Map, including any development that is ordinarily incidental or ancillary to development for that purpose
Prohibited Any development not specified in item 2 or 3

Zone RE1 Public Recreation
Permitted without consent Nil
Permitted with consent Boat launching ramps; Boat sheds; Building identification signs; Business identification signs; Car parks; Caravan parks; Charter and tourism boating facilities; Child care centres; Community facilities; Eco-tourist facilities; Emergency services facilities; Entertainment facilities; Environmental facilities; Environmental protection works; Extensive agriculture; Flood mitigation works; Food and drink premises; Function centres; Information and education facilities; Intensive plant agriculture; Jetties; Kiosks; Marinas; Markets; Recreation areas; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Respite day care centres; Roads; Water recreation structures; Water supply systems; Wharf or boating facilities
Prohibited Any development not specified in item 2 or 3

Zone RE2 Private Recreation
Permitted without consent Nil
Permitted with consent Building identification signs; Business identification signs; Car parks; Community facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Helipads; Kiosks; Marinas; Recreation areas; Recreation facilities (indoor); Recreation facilities (outdoor); Registered clubs; Roads; Water supply systems
Prohibited Any development not specified in item 2 or 3

Zone E1 National Parks and Nature Reserves
Permitted without consent Uses authorised under the National Parks and Wildlife Act 1974
Permitted with consent Nil
Prohibited Any development not specified in item 2 or 3

Zone W1 Natural Waterways
Permitted without consent Nil
Permitted with consent Boat launching ramps; Boat sheds; Charter and tourism boating facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Jetties; Marinas; Mooring pens; Moorings; Water recreation structures; Wharf or boating facilities
Prohibited Business premises; Hotel or motel accommodation; Industries; Multi dwelling housing; Recreation facilities (major); Residential flat buildings; Restricted premises; Retail premises; Seniors housing; Service stations; Warehouse or distribution centres; Any other development not specified in item 2 or 3

A residential dwelling erected on this land has not been identified in the Loose–Fill Asbestos Insulation Register as containing loose–fill ceiling insulation. Contact NSW Fair Trading for more information.

BANKSTOWN CUSTOMER SERVICE CENTRE
Upper Ground Floor, Civic Tower, 66-72 Rickard Road,
Bankstown NSW 2200, PO Box 8, Bankstown NSW 1885

CAMPSIE CUSTOMER SERVICE CENTRE
137 Beamish Street, Campsie NSW 2194
PO Box 77, Campsie NSW 2194

CANTERBURY-BANKSTOWN COUNCIL
ABN 45 985 891 846 P. 9707 9000 F. 9707 9
W. cbcity.nsw.gov.au

APPENDIX H

GROUNDWATER BORE SEARCH

⊞ Daily River Reports

Dams
favourites | search
download sites
find a site
⊞ Real Time Data - Ma...

Groundwater (Telemetered data)
favourites | search
download sites
find a site
⊞ Real Time Data - Bor...

All Groundwater Site details
search
download sites
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search by licence

ALL GROUNDWATER MAP

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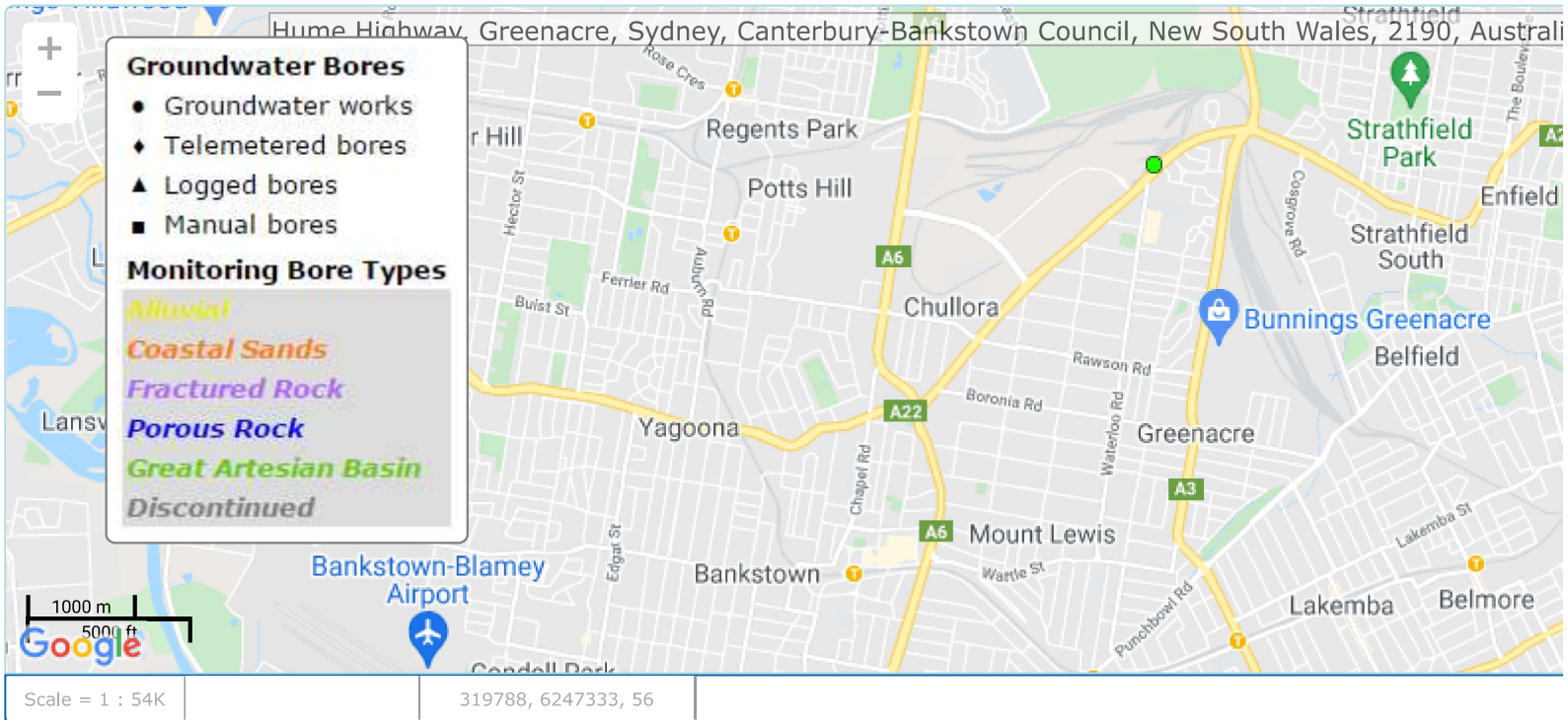
All data times are Eastern Standard Time

Map | Info



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APPENDIX I

LOCAL METEOROLOGY

Aargus

Monthly Rainfall (millimetres)

CANTERBURY RACECOURSE AWS

Station Number: 066194 · State: NSW · Opened: 1995 · Status: Open · Latitude: 33.91°S · Longitude: 151.11°E · Elevation: 3 m

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1995										5.0	106.6	46.8	
1996	140.0	17.8	25.4	30.8	127.2	75.0	63.4	137.8	68.6	12.2	56.6	10.4	765.2
1997	29.6	42.2	12.2	4.2	106.8	55.4	96.2	12.6		3.6	30.4	20.8	
1998	99.4	59.4	22.8	243.0	181.2	88.2	82.2	236.8	0.0	1.0	61.2	28.6	1103.8
1999	163.4	189.2	41.8	205.4	43.4	56.6	174.8	55.2	27.4	190.8	48.6	90.4	1287.0
2000	31.8	6.2	121.2	43.6	29.6	32.6	21.4	14.6	29.4	63.0	139.4	38.6	571.4
2001	181.6	144.4	67.6	75.6	242.0	15.6	92.0	53.0	23.8	36.8	71.6	23.2	1027.2
2002	73.8		35.8	37.2	69.2	14.8	10.0	9.2	10.8	32.0	23.2	89.2	
2003	9.0	74.6	77.6	205.8	314.6	63.2	40.2	40.2	8.6	67.4	87.2	75.6	1064.0
2004	62.8	109.2	96.0	82.8	11.0	9.0	30.8	88.2	74.4	218.4	53.8	77.0	913.4
2005	66.4	132.2	89.4	26.4	29.8	77.2	60.0	3.0	48.2	56.6	119.2	30.2	738.6
2006	75.4	52.8	35.4	2.0	13.6	146.0	93.2	73.6	156.6	6.4	37.2	105.8	798.0
2007	56.8	108.0	51.0	124.2	14.2	392.8	36.0	111.4	37.6	37.0	123.8	111.0	1203.8
2008	54.0	322.0	58.0	163.0	8.0	106.6	56.0	37.8	81.2	55.0	65.2	84.6	1091.4
2009	23.6	147.4	72.8	155.8	129.4	69.6	49.4	6.2	19.2	172.6	23.4	40.6	910.0
2010	27.4	144.8	29.0	19.4	110.6	103.2	58.2	21.0	65.6	87.2	172.4	64.8	903.6
2011	38.2	16.4	133.2			76.8		34.0	65.4	24.0	161.6	140.8	
2012	129.4	122.4	228.4	149.2	21.2	178.2	40.8	7.2	20.6	32.8	50.8	38.0	1019.0
2013	164.2	167.4		140.2	48.2	278.8	22.2	13.0	46.8	11.4	167.8	1.2	
2014	17.6	61.0	157.4	49.0	7.0	52.6	13.6	247.4	38.4	135.0	27.4	176.2	982.6
2015		51.2	37.6	397.6	105.2	83.2	53.2	60.8	52.4	28.4	76.8		
2016	259.6	14.0	99.6	65.0	10.4	296.4	95.4	139.4	60.2	20.4	26.8	68.0	1155.2
2017	50.0	165.0		74.4	17.2	108.8	6.6	22.6	0.2	52.6	37.4	60.4	
2018	24.6	121.4		12.4	13.4	112.2	6.0	5.8	76.4	194.2		92.0	
2019	74.4	72.6	149.0	19.4	7.4	121.2	38.0	41.6	106.8	27.4	30.6	7.0	695.4
2020	56.8	448.4	143.6	26.0	90.8	65.0	136.4	72.6	35.8	72.0	47.2	81.6	1276.2
2021	41.4	88.8	403.2	16.6	101.0	63.0	32.8	89.6					

Quality control: 12.3 Done & acceptable, *12.3* Not completed or unknown

Monthly Rainfall (millimetres)

CANTERBURY RACECOURSE AWS

Station Number: 066194 · State: NSW · Opened: 1995 · Status: Open · Latitude: 33.91°S · Longitude: 151.11°E · Elevation: 3 m

Statistics for this station calculated over all years of data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean	78.0	115.2	95.1	94.8	74.1	105.5	56.4	62.9	48.1	63.2	73.8	64.1	972.5
Lowest	9.0	6.2	12.2	2.0	7.0	9.0	6.0	3.0	0.0	1.0	23.2	1.2	571.4
5th percentile	18.8	14.5	23.1	5.8	7.5	15.0	7.3	5.9	1.5	4.0	24.1	7.7	676.8
10th percentile	24.0	17.0	26.1	14.1	9.0	24.1	11.4	6.7	9.3	5.7	27.0	14.6	725.6
Median	56.8	108.0	72.8	65.0	43.4	77.0	49.4	40.9	42.6	36.9	56.6	64.8	1000.8
90th percentile	163.9	180.5	155.7	205.6	160.5	228.5	95.9	138.6	79.8	181.7	152.7	108.9	1225.5
95th percentile	178.1	295.4	221.3	235.6	229.8	292.0	128.4	212.4	103.0	193.4	166.6	134.8	1277.8
Highest	259.6	448.4	403.2	397.6	314.6	392.8	174.8	247.4	156.6	218.4	172.4	176.2	1287.0

1) Calculation of statistics

Summary statistics, other than the Highest and Lowest values, are only calculated if there are at least 20 years of data available.

2) Gaps and missing data

Gaps may be caused by a damaged instrument, a temporary change to the site operation, or due to the absence or illness of an observer.

3) Further information

http://www.bom.gov.au/climate/cdo/about/about-rain-data.shtml.

Product code: IDCJAC0001 reference: 77979660 Created on Tue 31 Aug 2021 11:49:39 AM AEST

APPENDIX J

REGULATORY CRITERIA

NEPM 2013 - Schedule B1

Guideline on Investigation & Health or Ecological Screening Level For Soil

Table 1A(1) Health investigation levels for soil contaminants

Chemical	Health-based investigation levels (mg/kg)			
	Residential[1] A	Residential[1] B	Recreational[1] C	Commercial/ industrial[1] D
Metals and Inorganics				
Arsenic[2]	100	500	300	3 000
Beryllium	60	90	90	500
Boron	4500	40 000	20 000	300 000
Cadmium	20	150	90	900
Chromium (VI)	100	500	300	3600
Cobalt	100	600	300	4000
Copper	6000	30 000	17 000	240 000
Lead[3]	300	1200	600	1 500
Manganese	3800	14 000	19 000	60 000
Mercury (inorganic)[5]	40	120	80	730
Methyl mercury[4]	10	30	13	180
Nickel	400	1200	1200	6 000
Selenium	200	1400	700	10 000
Zinc	7400	60 000	30 000	400 000
Cyanide (free)	250	300	240	1 500
Polycyclic Aromatic Hydrocarbons (PAHs)				
Carcinogenic PAHs (as BaP TEQ)[6]	3	4	3	40
Total PAHs[7]	300	400	300	4000
Phenols				
Phenol	3000	45 000	40 000	240 000
Pentachlorophenol	100	130	120	660
Cresols	400	4 700	4 000	25 000
Organochlorine Pesticides				
DDT+DDE+DDD	240	600	400	3600
Aldrin and dieldrin	6	10	10	45
Chlordane	50	90	70	530
Endosulfan	270	400	340	2000
Endrin	10	20	20	100
Heptachlor	6	10	10	50
HCB	10	15	10	80
Methoxychlor	300	500	400	2500
Mirex	10	20	20	100
Toxaphene	20	30	30	160
Herbicides				
2,4,5-T	600	900	800	5000
2,4-D	900	1600	1300	9000

Chemical	Health-based investigation levels (mg/kg)			
	Residential[1] A	Residential[1] B	Recreational[1] C	Commercial/ industrial[1] D
MCPA	600	900	800	5000
MCPB	600	900	800	5000
Mecoprop	600	900	800	5000
Picloram	4500	6600	5700	35000
Other Pesticides				
Atrazine	320	470	400	2500
Chlorpyrifos	160	340	250	2000
Bifenthrin	600	840	730	4500
Other Organics				
PCBs[8]	1	1	1	7
PBDE Flame Retardants (Br1–Br9)	1	2	2	10

Notes:

(1) Generic land uses are described in detail in Schedule B7 Section 3

HIL A – Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake (no poultry), also includes childcare 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 apartments.

HIL C – Public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. This does not include undeveloped public open space where the potential for exposure is lower and where a site-specific assessment may be more appropriate.

HIL D – Commercial/industrial, includes premises such as shops, offices, factories and industrial sites.

(2) Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability may be important and should be considered where appropriate (refer Schedule B7).

(3) Lead: HIL is based on blood lead models (IEUBK for HILs A, B and C and adult lead model for HIL D where 50% oral bioavailability has been considered. Site-specific bioavailability may be important and should be considered where appropriate.

(4) Methyl mercury: assessment of methyl mercury should only occur where there is evidence of its potential source. It may be associated with inorganic mercury and anaerobic microorganism activity in aquatic environments. In addition the reliability and quality of sampling/analysis should be considered.

(5) 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,

(6) Carcinogenic PAHs: HIL is based on the 8 carcinogenic PAHs and their TEFs (potency relative to B(a)P) adopted by CCME 2008 (refer Schedule B7). The B(a)P TEQ is calculated by multiplying the concentration of each carcinogenic PAH in the sample by its B(a)P TEF, given below, and summing these products.

PAH species	TEF	PAH species	TEF
Benzo(a)anthracene	0.1	Benzo(g,h,i)perylene	0.01
Benzo(a)pyrene	1	Chrysene	0.01

Benzo(b+j)fluoranthene	0.1	Dibenz(a,h)anthracene	1
Benzo(k)fluoranthene	0.1	Indeno(1,2,3-c,d)pyrene	0.1

Where the B(a)P occurs in bitumen fragments it is relatively immobile and does not represent a significant health risk.

(7) Total PAHs: HIL is based on the sum of the 16 PAHs most commonly reported for contaminated sites (WHO 1998). The application of the total PAH HIL should consider the presence of carcinogenic PAHs and naphthalene (the most volatile PAH). Carcinogenic PAHs reported in the total PAHs should meet the B(a)P TEQ HIL. Naphthalene reported in the total PAHs should meet the relevant HSL.

(8) PCBs: HIL relates to non-dioxin-like PCBs only. Where a PCB source is known, or suspected, to be present at a site, a site-specific assessment of exposure to all PCBs (including dioxin-like PCBs) should be undertaken.

Table 1A(2) Interim soil vapour health investigation levels for volatile organic chlorinated compounds

Chemical	Interim soil vapour HIL (mg/m^3)			
	Residential[1] A	Residential[1] B	Recreational[1] C	Commercial / Industrial[1] D
TCE	0.02	0.02	0.4	0.08
1,1,1-TCA	60	60	1200	230
PCE	2	2	40	8
cis-1,2-dichloroethene	0.08	0.08	2	0.3
Vinyl chloride	0.03	0.03	0.5	0.1

Notes:

1. Land use settings are equivalent to those described in Table 1A(1) Footnote 1 and Schedule B7, though secondary school buildings should be assessed using residential 'A/B' for vapour intrusion purposes.
2. Interim HILs for VOCCs are conservative soil vapour concentrations that can be adopted for the purpose of screening sites where further investigation is required on a site-specific basis. They are based on the potential for vapour intrusion using an indoor air-to-soil vapour attenuation factor of 0.1 and an outdoor air-to-soil vapour attenuation factor of 0.05.
3. Application of the interim HILs is based on a measurement of shallow (to 1 m depth) soil vapour (or deeper where the values are to be applied to a future building with a basement) or sub-slab soil vapour.
4. The applicability of the interim HILs needs to be further considered when used for other building types such as homes with a crawl-space and no slab, which may require site-specific assessment.
5. Use of the interim HILs requires comparison with data that has been collected using appropriate methods and meets appropriate data quality requirements.
6. Oral and dermal exposure should be considered on a site-specific basis where direct contact exposure is likely to occur.

Table 1A(3) Soil HSLs for vapour intrusion (mg/kg)

	HSL A & HSL B Low – high density residential				HSL C recreational / open space				HSL D Commercial / Industrial				
CHEMICAL	**0 m to <1 m**	**1 m to <2 m**	**2 m to <4m**	**4 m+**	**0 m to <1 m**	**1 m to <2 m**	**2 m to <4 m**	**4 m+**	**0 m to <1 m**	**1 m to <2 m**	**2 m to <4 m**	**4 m+**	**Soil saturation concentration (Csat)**
SAND													
Toluene	160	220	310	540	NL	NL	NL	NL	NL	NL	NL	NL	560
Ethylbenzene	55	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	64
Xylenes	40	60	95	170	NL	NL	NL	NL	230	NL	NL	NL	300
Naphthalene	3	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	9
Benzene	0.5	0.5	0.5	0.5	NL	NL	NL	NL	3	3	3	3	360
F1[9]	45	70	110	200	NL	NL	NL	NL	260	370	630	NL	950
F2[10]	110	240	440	NL	NL	NL	NL	NL	NL	NL	NL	NL	560
SILT													
Toluene	390	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	640
Ethylbenzene	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	69

	HSL A & HSL B Low – high density residential				HSL C recreational / open space				HSL D Commercial / Industrial				
Xylenes	95	210	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	330
Naphthalene	4	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	10
Benzene	0.6	0.7	1	2	NL	NL	NL	NL	4	4	6	10	440
F1[9]	40	65	100	190	NL	NL	NL	NL	250	360	590	NL	910
F2[10]	230	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	570
CLAY													
Toluene	480	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	630
Ethylbenzene	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	68
Xylenes	110	310	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	330
Naphthalene	5	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	10
Benzene	0.7	1	2	3	NL	NL	NL	NL	4	6	9	20	430
F1[9]	50	90	150	290	NL	NL	NL	NL	310	480	NL	NL	850
F2[10]	280	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	560

Notes:

(1) Land use settings are equivalent to those described in Table 1A(1) Footnote 1 and Schedule B7. HSLs for vapour intrusion for high density residential assume residential occupation of the ground floor. If communal car parks or commercial properties occupy the ground floor, HSL D should be used,

(2) The key limitations of the HSLs should be referred to prior to application and are presented in Friebel and Nadebaum (2011b and 2011d).

(3) Detailed assumptions in the derivation of the HSLs and information on how to apply the HSLs are presented in Friebel and Nadebaum (2011a and 2011b).

(4) Soil HSLs for vapour inhalation incorporate an adjustment factor of 10 applied to the vapour phase partitioning to reflect the differences observed between theoretical estimates of soil vapour partitioning and field measurements. Refer Friebel & Nadebaum (2011a) for further information.

(5) The soil saturation concentration (Csat) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds Csat, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'.

(6) The HSLs for TPH C_6-C_{10} in sandy soil are based on a finite source that depletes in less than seven years, and therefore consideration has been given to use of sub-chronic toxicity values. The >C_8-C_{10} aliphatic toxicity has been adjusted to represent sub-chronic exposure, resulting in higher HSLs than if based on chronic toxicity. For further information refer to Section 8.2 and Appendix J in Friebel and Nadebaum (2011a).

(7) The figures in the above table may be multiplied by a factor to account for biodegradation of vapour. A factor of 10 may apply for source depths from 2 m to <4 m or a factor of 100 for source depths of 4 m and deeper. To apply the attenuation factor for vapour degradation, a number of conditions must be satisfied. Firstly the maximum length of the shorter side of the concrete slab and surrounding pavement cannot exceed 15 m, as this would prevent oxygen penetrating to the centre of the slab. Secondly, measurement of oxygen in the subsurface is required to determine the potential for biodegradation. Oxygen must be confirmed to be present at >5% to use these factors.

(8) For soil texture classification undertaken in accord with AS 1726, the classifications of sand, silt and clay may be applied as coarse, fine with liquid limit <50% and fine with liquid limit>50% respectively, as the underlying properties to develop the HSLs may reasonably be selected to be similar. Where there is uncertainty, either a conservative approach may be adopted or laboratory analysis should be carried out.

(9) To obtain F1 subtract the sum of BTEX concentrations from the C_6-C_{10} fraction.

(10) To obtain F2 subtract naphthalene from the >C_{10}-C_{16} fraction.

Table 1A(4) Groundwater HSLs for vapour intrusion (mg/L)

	HSL A & HSL B Low – high density residential			HSL C recreational / open space			HSL D Commercial / industrial			
CHEMICAL	**2 m to <4 m**	**4 m to <8 m**	**8 m+**	**2 m to <4 m**	**4 m to <8 m**	**8 m+**	**2 m to <4 m**	**4 m to <8 m**	**8 m+**	**Solubility limit**
SAND										
Toluene	NL	NL	NL	NL	NL	NL	NL	NL	NL	61
Ethylbenzene	NL	NL	NL	NL	NL	NL	NL	NL	NL	3.9
Xylenes	NL	NL	NL	NL	NL	NL	NL	NL	NL	21
Naphthalene	NL	NL	NL	NL	NL	NL	NL	NL	NL	0.17
Benzene	0.8	0.8	0.9	NL	NL	NL	5	5	5	59
F1[7]	1	1	1	NL	NL	NL	6	6	7	9.0
F2[8]	1	1	1	NL	NL	NL	NL	NL	NL	3.0
SILT										
Toluene	NL	NL	NL	NL	NL	NL	NL	NL	NL	61
Ethylbenzene	NL	NL	NL	NL	NL	NL	NL	NL	NL	3.9
Xylenes	NL	NL	NL	NL	NL	NL	NL	NL	NL	21
Naphthalene	NL	NL	NL	NL	NL	NL	NL	NL	NL	0.17

	HSL A & HSL B Low – high density residential			HSL C recreational / open space			HSL D Commercial / industrial			
Benzene	4	5	5	NL	NL	NL	30	30	30	59
F1[7]	6	6	6	NL	NL	NL	NL	NL	NL	9.0
F2[8]	NL	NL	NL	NL	NL	NL	NL	NL	NL	3.0
CLAY										
Toluene	NL	NL	NL	NL	NL	NL	NL	NL	NL	61
Ethylbenzene	NL	NL	NL	NL	NL	NL	NL	NL	NL	3.9
Xylenes	NL	NL	NL	NL	NL	NL	NL	NL	NL	21
Naphthalene	NL	NL	NL	NL	NL	NL	NL	NL	NL	0.17
Benzene	5	5	5	NL	NL	NL	30	30	35	59
F1[7]	NL	NL	NL	NL	NL	NL	NL	NL	NL	9.0
F2[8]	NL	NL	NL	NL	NL	NL	NL	NL	NL	3.0

Notes:

(1) Land use settings are equivalent to those described in Table 1A(1) Footnote 1 and Schedule B7. HSLs for vapour intrusion for high density residential assume residential occupation of the ground floor. If communal car parks or commercial properties occupy the ground floor, HSL D should be used,

(2) The key limitations of the HSLs are presented in Friebel and Nadebaum (2011d) and should be referred to prior to application.

(3) Detailed assumptions in the derivation of the HSLs and information on the application of the HSLs are presented in Friebel and Nadebaum (2011a and 2011b).

(4) The solubility limit is defined as the groundwater concentration at which the water cannot dissolve any more of an individual chemical based on a petroleum mixture. The soil vapour that is in equilibrium with the groundwater will be at its maximum. If the derived groundwater HSL exceeds the water solubility limit, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'.

(5) The figures in the above table may be multiplied by a factor to account for biodegradation of vapour. A factor of 10 may apply for source depths from 2 m to <4 m or a factor of 100 for source depths of 4 m and deeper. To apply the attenuation factor for vapour degradation, a number of conditions must be satisfied. Firstly, the maximum length of the shorter side of the concrete slab

and surrounding pavement cannot exceed 15 m, as this would prevent oxygen penetrating to the centre of the slab. Secondly, measurement of oxygen in the subsurface is required to determine the potential for biodegradation. Oxygen must be confirmed to be present at >5% to use these factors.

(6) For soil texture classification undertaken in accord with AS 1726, the classifications of sand, silt and clay may be applied as coarse, fine with liquid limit <50% and fine with liquid limit >50% respectively, as the underlying properties to develop the HSLs may reasonably be selected to be similar. Where there is uncertainty, either a conservative approach may be adopted or laboratory analysis should be carried out.

(7) To obtain F1 subtract the sum of BTEX concentrations from the C_6-C_{10} fraction.

(8) To obtain F2 subtract naphthalene from the >C_{10}-C_{16} fraction.

Table 1A(5) Soil vapour HSLs for vapour intrusion (mg/m³)

	HSL A & HSL B Low – high density residential					HSL C recreational / open space					HSL D Commercial / Industrial				
CHEMICAL	**0 m to <1 m**	**1 m to <2 m**	**2 m to <4 m**	**4 m to <8 m**	**8 m+**	**0 m to <1 m**	**1 m to <2 m**	**2 m to <4 m**	**4 m to <8 m**	**8 m+**	**0 m to <1 m**	**1 m to <2 m**	**2 m to <4 m**	**4 m to <8 m**	**8 m+**
SAND															
Toluene	1300	3800	7300	15 000	29 000	NL	NL	NL	NL	NL	4800	16 000	39 000	84 000	NL
Ethylbenzene	330	1100	2200	4300	8700	NL	NL	NL	NL	NL	1300	4600	11 000	25 000	53 000
Xylenes	220	750	1500	3000	6100	NL	NL	NL	NL	NL	840	3,200	8000	18 000	37 000
Naphthalene	0.8	3	6	10	25	410	NL	NL	NL	NL	3	15	35	75	150
Benzene	1	3	6	10	20	360	2400	4700	9500	19 000	4	10	30	65	130
F1[8]	180	640	1,300	2600	5300	86 000	NL	NL	NL	NL	680	2800	7000	15 000	32 000
F2[9]	130	560	1200	2400	4800	NL	NL	NL	NL	NL	500	2400	NL	NL	NL
SILT															
Toluene	1400	14 000	32 000	69 000	140 000	NL	NL	NL	NL	NL	5700	63 000	NL	NL	NL
Ethylbenzene	380	4200	9700	21 000	43 000	NL	NL	NL	NL	NL	1500	19 000	54 000	NL	NL
Xylenes	260	2900	6800	15 000	30 000	NL	NL	NL	NL	NL	1000	13 000	38 000	NL	NL
Naphthalene	0.9	10	25	60	120	NL	NL	NL	NL	NL	4	50	150	350	750
Benzene	1	10	25	55	110	1800	12 000	24 000	48 000	97 000	4	50	140	320	670

Aargus

	HSL A & HSL B Low – high density residential					HSL C recreational / open space					HSL D Commercial / Industrial				
F1[8]	210	2600	6000	13 000	26 000	NL	NL	NL	NL	NL	850	11 000	33 000	77 000	160 000
F2[9]	160	2300	5400	NL	NL	NL	NL	NL	NL	NL	670	NL	NL	NL	NL
CLAY															
Toluene	1600	23 000	53 000	110 000	NL	NL	NL	NL	NL	NL	6500	100 000	NL	NL	NL
Ethylbenzene	420	6800	16 000	35 000	NL	NL	NL	NL	NL	NL	1800	31 000	NL	NL	NL
Xylenes	280	4800	11 000	24 000	50 000	NL	NL	NL	NL	NL	1200	21 000	NL	NL	NL
Naphthalene	1	20	45	95	200	NL	NL	NL	NL	NL	4	85	240	560	1200
Benzene	1	15	40	90	180	3000	20 000	40 000	81 000	160 000	5	80	230	530	1100
F1[8]	230	4200	9900	21 000	44 000	NL	NL	NL	NL	NL	1000	19 000	55 000	130 000	270 000
F2[9]	180	3,800	NL	NL	NL	NL	NL	NL	NL	NL	800	NL	NL	NL	NL

1. Land use settings are equivalent to those described in Table 1A(1) Footnote 1 and Schedule B7. HSLs for vapour intrusion for high density residential assume residential occupation of the ground floor. If communal car parks or commercial properties occupy the ground floor, HSL D should be used,
2. The key limitations of the HSLs should be referred to prior to application and are presented in Friebel and Nadebaum (2011b and 2011d).
3. Detailed assumptions in the derivation of the HSLs and information on how to apply the HSLs are presented in Friebel and Nadebaum (2011a and 2011b).
4. The maximum possible soil vapour concentrations have been calculated based on vapour pressures of the pure chemicals. Where soil vapour HSLs exceed these values a soil-specific source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'.
5. Soil vapour HSLs should be compared with measurements taken as laterally close as possible to the soil or groundwater sources of vapour (i.e. within or above vapour sources). Consideration is required of where the sample is taken, the current condition of the site and the likely future condition of the site. Shallow gas measurements in open space (less than 1 m below ground surface) may be subject to influences of weather conditions and moisture.
6. The figures in the above table may be multiplied by a factor to account for biodegradation of vapour. A factor of 10 may apply for source depths from 2 m to <4 m or a factor of 100 for source depths of 4 m and deeper. To apply the attenuation factor for vapour degradation, a number of conditions must be satisfied. Firstly, the maximum length of the shorter side of the concrete slab and surrounding pavement cannot exceed 15 m, as this would prevent oxygen penetrating to the centre of the slab. Secondly, measurement of oxygen in the subsurface is required to determine the potential for biodegradation. Oxygen must be confirmed to be present at >5% to use these factors.

7. For soil texture classification undertaken in accord with AS 1726, the classifications of sand, silt and clay may be applied as coarse, fine with liquid limit <50% and fine with liquid limit >50% respectively as the underlying properties to develop the HSLs may reasonably be selected to be similar. Where there is uncertainty, either a conservative approach may be adopted or laboratory analysis should be carried out.
8. To obtain F1 subtract the sum of BTEX concentrations from the C_6-C_{10} fraction.
9. To obtain F2 subtract naphthalene from the >C_{10}-C_{16} fraction.

Table 1B(1) Soil-specific added contaminant limits for aged zinc in soil

Zn added contaminant limits (ACL, mg added contaminant/kg)						
Areas of ecological significance						
***pH*[a]**	***CEC*[b] *(cmol$_c$/kg)***					
	5	***10***	***20***	***30***	***40***	***60***
4.0	15	20	20	20	20	20
4.5	20	25	25	25	25	25
5.0	30	40	40	40	40	40
5.5	40	60	60	60	60	60
6.0	50	90	90	90	90	90
6.5	50	90	130	130	130	130
7.0	50	90	150	190	190	190
7.5	50	90	150	210	260	280
Urban residential/public open space[1]						
***pH*[a]**	***CEC*[b] *(cmol$_c$/kg)***					
	5	***10***	***20***	***30***	***40***	***60***
4.0	70	85	85	85	85	85
4.5	100	120	120	120	120	120
5.0	130	180	180	180	180	180
5.5	180	270	270	270	270	270
6.0	230	400	400	400	400	400
6.5	230	400	590	590	590	590
7.0	230	400	700	880	880	880
7.5	230	400	700	960	1200	1300
Commercial/industrial						
***pH*[a]**	***CEC*[b] *(cmol$_c$/kg)***					
	5	***10***	***20***	***30***	***40***	***60***
4.0	110	130	130	130	130	130
4.5	150	190	190	190	190	190
5.0	210	290	290	290	290	290
5.5	280	420	420	420	420	420
6.0	360	620	620	620	620	620
6.5	360	620	920	920	920	920
7.0	360	620	1100	1400	1400	1400
7.5	360	620	1100	1500	1900	2000

1. Urban residential/public open space is broadly equivalent to the HIL A, HIL B and HIL C land use scenarios in Table 1A(1) Footnote 1 and as described in Schedule B7.
2. Aged values apply to contamination present in soil for at least two years. For fresh contamination refer to Schedule B5c.
3. The EIL is calculated from summing the ACL and the ABC.

a = pH measured using the $CaCl_2$ method (Rayment & Higginson 1992).

b = CEC measured using the silver thiourea method (Chabra et al. 1972).

Table 1B(2) Soil-specific added contaminant limits for aged copper in soils

Cu added contaminant limits (ACL, mg added contaminant/kg)					
Areas of ecological significance					
CEC ($cmol_c/kg$)[a] based					
5	***10***	***20***	***30***	***40***	***60***
30	65	70	70	75	80
pH[b] based					
4.5	***5.5***	***6***	***6.5***	***7.5***	***8.0***
20	45	65	90	190	270
Urban residential/public open space[1]					
CEC ($cmol_c/kg$)[a] based					
5	***10***	***20***	***30***	***40***	***60***
95	190	210	220	220	230
pH[b] based					
4.5	***5.5***	***6***	***6.5***	***7.5***	***8.0***
60	130	190	280	560	800
Commercial/industrial					
CEC ($cmol_c/kg$)[a] based					
5	***10***	***20***	***30***	***40***	***60***
140	280	300	320	330	340
pH[b] based					
4.5	***5.5***	***6***	***6.5***	***7.5***	***8.0***
85	190	280	400	830	1200

Notes:

1. Urban residential/public open space is broadly equivalent to the HIL A, HIL B and HIL C land use scenarios in Table 1A(1) Footnote 1 and as described in Schedule B7.
2. The lower of the CEC or the pH-based ACLs for the land use and soil conditions is the ACL to be used.
3. Aged values apply to contamination present in soil for at least two years. For fresh contamination refer to Schedule B5c.
4. The EIL is calculated from summing the ACL and the ABC.

a = CEC measured using the silver thiourea method (Chabra et al. 1972).

b = pH measured using the $CaCl_2$ method (Rayment & Higginson 1992).

Table 1B(3) Soil-specific added contaminant limits for aged chromium III and nickel in soil

CHEMICAL	Clay content (% clay)	Added contaminant limits (mg added contaminant/kg) for various land uses		
		Areas of ecological significance	Urban residential and public open space	Commercial and industrial
Chromium III	*1*	60	190	310
	2.5	80	250	420
	5	100	320	530
	≥10	130	400	660
Nickel	CEC[a] ($cmol_c/kg$)	Areas of ecological significance	Urban residential and public open space[1]	Commercial and industrial
	5	5	30	55
	10	30	170	290
	20	45	270	460
	30	60	350	600
	40	70	420	730
	60	95	560	960

Notes:

1. Urban residential/public open space is broadly equivalent to the HIL A, HIL B and HIL C land use scenarios in Table 1A(1) Footnote 1 and as described in Schedule B7.
2. Aged values apply to contamination present in soil for at least two years. For fresh contamination refer to Schedule B5c.
3. The EIL is calculated from summing the ACL and the ABC.

a = CEC measured using the silver thiourea method (Chabra et al. 1972).

Table 1B(4) Generic added contaminant limits for lead in soils irrespective of their physicochemical properties

	Pb added contaminant limit (ACL, mg added contaminant/kg) for various land uses		
CHEMICAL	Areas of ecological significance	Urban residential and public open space[1]	Commercial and industrial
Lead	470	1100	1800

Notes:

1. Urban residential/public open space is broadly equivalent to the HIL A, HIL B and HIL C land use scenarios in Table 1A(1) Footnote 1 and as described in Schedule B7.
2. Aged values are applicable to lead contamination present in soil for at least two years. For fresh contamination refer to Schedule B5c.
3. The EIL is calculated from summing the ACL and the ABC.

Table 1B(5) Generic EILs for aged As, fresh DDT and fresh naphthalene in soils irrespective of their physicochemical properties

	Ecological Investigation Levels (mg total contaminant/kg)		
CHEMICAL	Areas of ecological significance	Urban residential and public open space[1]	Commercial and industrial
Arsenic[2]	40	100	160
DDT[3]	3	180	640
Naphthalene[3]	10	170	370

Notes:

1. Urban residential/public open space is broadly equivalent to the HIL-A, HIL-B and HIL-C land use scenarios in Table 1A(1) Footnote 1 and as described in Schedule B7.
2. Aged values are applicable to arsenic contamination present in soil for at least two years. For fresh contamination refer to Schedule B5c.
3. Insufficient data was available to calculate aged values for DDT and naphthalene, consequently the values for fresh contamination should be used.
4. Insufficient data was available to calculate ACLs for As, DDT and naphthalene. The EIL should be taken directly from Table 1B(5).

Table 1B(6) ESLs for TPH fractions F1 – F4, BTEX and benzo(a)pyrene in soil

CHEMICAL	Soil texture	ESLs (mg/kg dry soil)		
		Areas of ecological significance	Urban residential and public open space	Commercial and industrial
F1 C_6-C_{10}	*Coarse/ Fine*	125*	180*	215*
F2 >C_{10}-C_{16}		25*	120*	170*
F3 >C_{16}-C_{34}	*Coarse*	-	300	1700
	Fine	-	1300	2500
F4 >C_{34}-C_{40}	*Coarse*	-	2800	3300
	Fine	-	5600	6600
Benzene	*Coarse*	8	50	75
	Fine	8	65	95
Toluene	*Coarse*	10	85	135
	Fine	65	105	135
Ethylbenzene	*Coarse*	1.5	70	165
	Fine	40	125	185
Xylenes	*Coarse*	10	105	180
	Fine	1.6	45	95
Benzo(a)pyrene	*Coarse*	0.7	0.7	1.4
	Fine	0.7	0.7	1.4

Notes:

(1) ESLs are of low reliability except where indicated by * which indicates that the ESL is of moderate reliability.

(2) '-' indicates that insufficient data was available to derive a value.

(3) To obtain F1, subtract the sum of BTEX concentrations from C_6-C_{10} fraction.

Table 1 B(7) Management Limits for TPH fractions F1–F4 in soil

TPH fraction	Soil texture	Management Limits[1] (mg/kg dry soil)	
		Residential, parkland and public open space	Commercial and industrial
F1[2] C_6- C_{10}	*Coarse*	700	700
	Fine	800	800
F2[2] >C_{10}-C_{16}	*Coarse*	1000	1000
	Fine	1000	1000
F3 >C_{16}-C_{34}	*Coarse*	2500	3500
	Fine	3500	5000
F4 >C_{34}-C_{40}	*Coarse*	10 000	10 000
	Fine	10 000	10 000

[1] Management limits are applied after consideration of relevant ESLs and HSLs

[2] Separate management limits for BTEX and naphthalene are not available hence these should not be subtracted from the relevant fractions to obtain F1 and F2.

Table 4

SOIL HEALTH SCREENING LEVELS FOR DIRECT CONTACT (mg/kg)[a,b]

Chemical	HSL-A Residential (Low Density)	HSL-B Residential (High **Density**)	HSL-C Recreational Open Space	HSL-D Commercial / Industrial
Toluene	14,000	21,000	18,000	99,000
Ethylbenzene	4,500	5,900	5,300	27,000
Xylenes	12,000	17,000	15,000	81,000
Naphthalene	1,400	2,200	1,900	11,000
Benzene	100	140	120	430
C6-C10	4,400	5,600	5,100	26,000
>C10-C16	3,300	4,200	3,800	20,000
>C16-C34	4,500	5,800	5,300	27,000
>C34-C40	6,300	8,100	7,400	38,000

Note:

(a) Derived assumptions used in the derivation of the HSLs and information on how to apply the HSLs are presented in:

- Frebel E & Nadebaum P 2011. Health screening levels for petroleum hydrocarbons in soil and groundwater Part 1: Technical development document, CRC CARE Technical Report no. 10, CRC for Contamination Assessment and Remediation of the Environment, Adelaide, Australia
- Frebel E & Nadebaum P 2011. Health screening levels for petroleum hydrocarbons in soil and groundwater Part 2: Application document, CRC CARE Technical Report no. 10, CRC for Contamination Assessment and Remediation of the Environment, Adelaide, Australia

(b) The key limitations in the development of the HSLs should be referred to prior to application. These are presented in the text of the summary document and the HSL application checklist in Appendix A of the Application Document (Frebel & Nadebaum 2011 – Part 2)

Table 7: Health screening levels for asbestos contamination in soil

Form of Asbestos	Health Screening Level (w/w)			
	Residential A[1]	Residential B[2]	**Recreational C[3]**	Commercial/ Industrial D[4]
Bonded ACM	0.01%	0.04%	**0.02%**	0.05%
FA & AF (friable asbestos & fines)	**0.001%**			
All forms of asbestos	**No visible asbestos for surface soil**			

Notes:

1. Residential A with garden/accessible soil also includes children's day care centres, preschools and primary schools.
2. Residential B with minimal opportunities for soil access; includes dwellings with fully and permanently paved yard space such as high-rise buildings and apartments.
3. Residential C includes public open space such as parks, playgrounds, playing fields (e.g. Ovals), secondary schools and unpaved footpaths.
4. Commercial/Industrial D includes premises such as shops, offices, factories and industrial sites.

PFAS - Environmental Guideline Values

Source: PFAS National Environmental Management Plan Version 2.0 – January 2020

PFAS ENVIRONMENTAL GUIDELINE VALUES

1. Human Health Guideline Values

The national methodologies used by health agencies in deriving the values in Table 1 include a level of conservatism in the drinking water and recreational water health-based guideline values. The methods assume only a minor portion (10%) of the TDI is allocated to this source. Therefore, 90% of intake is attributed to other exposure pathways, which means that exceeding these values does not constitute a risk if other pathways are controlled.

The recreational water quality values have been updated from the values published in the NEMP 1.0 and are based on revised numbers derived by NHMRC (2019). The revised numbers are based on changes in the assumption for the frequency and likelihood of exposure during recreational activities.

Table 1. Human health guideline values developed by health regulators

Sum of PFOS and PFHxS	PFOA	Description	Comments and source
0.02 µg/kg$_{bw}$/day	0.16 µg/kg$_{bw}$/day	Tolerable daily intake (TDI)	FSANZ 2017
0.07 µg/L	0.56 µg/L	Drinking water quality guideline value	Australian Government Department of Health 2019
2 µg/L	10 µg/L	Recreational water quality guideline value*	NHMRC 2019

Notes: bw = body weight, µg = micrograms.

Where the guideline values refer to the sum of PFOS and PFHxS, this includes PFOS only, PFHxS only, and the sum of the two.

*NHMRC (2019) notes that people's use of recreational water is not the same, given Australia's climate and geography. Some recreational water resources may be used less frequently than the assumed guidelines (150 days/year), and (in rare cases) some may be used more frequently. In such cases more locally-appropriate event frequency based recreational guidelines can be considered in consultation with the state and regulatory health regulator.

Source: PFAS National Environmental Management Plan Version 2.0 – January 2020

1.1 Human health investigation levels for soil

Table 2. Human health investigation levels for soil

Sum of PFOS and PFHxS	PFOA	Land use	Comments and source
0.01 mg/kg	0.1 mg/kg	Residential with garden/accessible soil (HIL A)	Assumes home-grown produce provides up to 10% of fruit and vegetable intake (does not account for consumption of any eggs from home poultry, nor of milk or meat from stock on the premises). Also includes children's day care centres, preschools and primary schools. The HILs were derived using the methodology consistent with assumptions set out in the ASC NEPM for HIL A. Note: If home-grown produce provides more than the 10% of fruit and vegetable intake assumed in the ASC NEPM generic example, a site-specific risk assessment is required. As an example, if home grown produce provides up to 50% of fruit and vegetable intake, the screening value would be 0.002 mg/kg for the sum of PFOS and PFHxS, and 0.02 mg/kg for PFOA.
2 mg/kg	20 mg/kg	Residential with minimal opportunities for soil access (HIL B)	Assumes no potential use of soil for consumption of home-grown produce. Includes dwellings with fully and permanently paved yard space such as high rise-buildings and flats. These were derived using the methodology consistent with assumptions set out in the ASC NEPM for HIL B.
1 mg/kg	10 mg/kg	Public open space (HIL C)	Relevant for public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools (except for soil used for agricultural studies) and footpaths. Excludes undeveloped public open space (such as urban bushland and reserves), which should be subject to a site-specific assessment where appropriate. These were derived using the methodology consistent with assumptions set out in the ASC NEPM for HIL C.
20 mg/kg	50 mg/kg	Industrial/ commercial (HIL D)	Assumes 8 hours is spent indoors and 1 hour spent outdoors at a site such as a shop, office, factory or industrial site. If the typical exposure for a site is predominantly outdoors with significant earthen areas, recalculation of a site-specific value is recommended. These were derived using the methodology consistent with assumptions set out in the ASC NEPM for HIL D. Note: the industrial/commercial direct exposure criterion for PFOA (including its salts and related compounds) has been set as 50 mg/kg in anticipation of the Stockholm Convention low content limit of 50 mg/kg.
Note: Where the guideline values refer to the sum of PFOS and PFHxS, this includes PFOS only, PFHxS only, and the sum of the two.			

Source: PFAS National Environmental Management Plan Version 2.0 – January 2020

2. Ecological guideline values

The ecological guideline values are used to assess and investigate potential risks to aquatic and terrestrial ecosystems.

2.1 Ecological soil guidelines values

Table 3. Ecological guideline values for soil

Exposure scenario	PFOS	PFOA	Land use	Comments and source
Ecological direct exposure	1 mg/kg	10 mg/kg	All land uses	Future work may be undertaken to review available soil guideline values proposed by Australian research and industry organisations The human health screening value for public open space is used as an interim value (see Table 2 above).
Ecological indirect exposure	0.01 mg/kg		All land uses	The guideline value is based on dietary exposure of a secondary consumer as the most sensitive exposure pathway assessed. This value may not be protective of specific animals relevant to Australia, including predatory animals such as quolls, antechinus and reptiles. For intensively developed sites with no secondary consumers and minimal potential for indirect ecological exposure, a higher criterion of up to 0.14 mg/kg may be appropriate as outlined in the accompanying text in section 8.2.1.

Source: PFAS National Environmental Management Plan Version 2.0 – January 2020

2.2 Ecological water quality guideline values

Table 5 Ecological water quality guideline values developed by water regulators

Exposure scenario	PFOS	PFOA	Exposure scenario	Comments and source
Freshwater	0.00023 µg/L	19 µg/L	99% species protection - high conservation value systems	Australian and New Zealand Guidelines for Fresh and Marine Water Quality - technical draft default guideline values for PFOS and PFOA. Note 1: The 99% species protection level for PFOS is close to the level of detection. Agencies may wish to apply a 'detect' threshold in such circumstances rather than a quantified measurement. Note 2: The draft guidelines do not account for effects which result from the biomagnification of toxicants in air-breathing animals or in animals which prey on aquatic organisms. Note 3: The WQGs advise that the 99% level of protection be used for slightly to moderately disturbed systems. This approach is generally adopted for chemicals that bioaccumulate and biomagnify in wildlife. Regulators may specify or environmental legislation may prescribe the level of species protection required, rather than allowing for case-by-case assessments.
	0.13 µg/L	220 µg/L	95% species protection - slightly to moderately disturbed systems	
	2 µg/L	632 µg/L	90% species protection - highly disturbed systems	
	31 µg/L	1824 µg/L	80% species protection - highly disturbed systems	
Interim marine	0.00023 µg/L	19 µg/L	99% species protection - high conservation value systems	As above. Freshwater values are to be used on an interim basis until final marine guideline values can be set using the nationally-agreed process under the Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Note 1: The WQG advise that in the case of estuaries, the most stringent of freshwater and marine criteria apply, taking account of any available salinity correction. Note 2: Marine guideline values developed by CRC CARE are under consideration through the nationally-agreed water quality guideline development process.
	0.13 µg/L	220 µg/L	95% species protection - slightly to moderately disturbed systems	
	2 µg/L	632 µg/L	90% species protection - highly disturbed systems	
	31 µg/L	1824 µg/L	80% species protection - highly disturbed systems	

Source: PFAS National Environmental Management Plan Version 2.0 – January 2020

NEPM 2013 - Schedule B1

Guideline - Groundwater Investigation Levels

Table 1C Groundwater Investigation Levels (GILs)

Substance		Groundwater Investigation Levels		
		Fresh Waters[A]	Marine Waters[A]	Drinking Water[B]
		(µg/L)	(µg/L)	(mg/L)
Metals and Metalloids				
Aluminium, Al pH>6.5		55	-	-
Antimony		-	-	0.003
Arsenic		24 as As(III) 13 as As(V)	-	0.01
Barium		-	-	2
Beryllium		-	-	0.06
Boron		370[C]	-	4
Cadmium	H	0.2	0.7[D]	0.002
Chromium, Cr (III)	H	-	27	-
Chromium, Cr (VI)		1[C]	4.4	0.05
Cobalt		-	1	-
Copper	H	1.4	1.3	2
Iron, (Total)		-	-	-
Lead	H	3.4	4.4	0.01
Manganese		1900[C]	-	0.5
Mercury (Total)		0.06[D]	0.1[D]	0.001
Molybdenum		-	-	0.05
Nickel	H	11	7	0.02
Selenium (Total)		5[D]	-	0.01
Silver		0.05	1.4	0.1
Tributyl tin (as Sn)		-	0.006[C]	-
Tributyl tin oxide		-	-	0.001
Uranium		-	-	0.017
Vanadium		-	100	-
Zinc	H	8[C]	15[C]	-
Non-metallic Inorganics				
Ammonia[E] (as NH_3-N at pH 8)		900[C]	910	-
Bromate		-	-	0.02
Chloride		-	-	-
Cyanide (as un-ionised Cn)		7	4	0.08
Fluoride		-	-	1.5

Substance	Groundwater Investigation Levels		
	Fresh Waters[A]	Marine Waters[A]	Drinking Water[B]
	(µg/L)	(µg/L)	(mg/L)
Hydrogen sulphide (un-ionised H_2S measured as S)	1	-	-
Iodide	-	-	0.5
Nitrate (as NO_3)	refer to guideline	refer to guideline	50
Nitrite (as NO_2)	refer to guideline	refer to guideline	3
Nitrogen	refer to guideline	refer to guideline	-
Phosphorus	refer to guideline	refer to guideline	-
Sulphate (as SO_4)	-	-	500
Organic alchohols/other organics			
Ethanol	1400	-	-
Ethylenediamine tetra-acetic acid (EDTA)	-	-	0.25
Formaldehyde	-	-	0.5
Nitrilotriacetic acid	-	-	0.2
Anilines			
Aniline	8	-	-
2,4-Dichloroaniline	7	-	-
3,4-Dichloroaniline	3	150	-
Chlorinated Alkanes			
Dichloromethane	-	-	0.004
Trihalomethanes (total)	-	-	0.25
Tetrachloromethane (carbon tetrachloride)	-	-	0.003
1,2-Dichloroethane	-	-	0.003
1,1,2-Trichloroethane	6500	1900	-
Hexachloroethane	290[D]	-	-
Chlorinated Alkenes			
Chloroethene (vinyl chloride)	-	-	0.0003
1,1-Dichloroethene	-	-	0.03
1,2-Dichoroethene	-	-	0.06
Tetrachloroethene (PCE) (Perchloroethene)	-	-	0.05

Substance	Groundwater Investigation Levels		
	Fresh Waters[A]	Marine Waters[A]	Drinking Water[B]
	(µg/L)	(µg/L)	(mg/L)
Chlorinated Benzenes			
Chlorobenzene	-	-	0.3
1,2- Dichlorobenzene	160	-	1.5
1,3- Dichlorobenzene	260	-	-
1,4- Dichlorobenzene	60	-	0.04
1,2,3- Trichlorobenzene	3[D]	-	0.03 for individual or total trichlorobenzenes
1,2,4- Trichlorobenzene	85[D]	20[D]	
1,3,5-Trichlorobenzene	-	-	
Polychlorinated Biphenyls (PCBs)			
Aroclor 1242	0.3[D]	-	-
Aroclor 1254	0.01[D]	-	-
Other Chlorinated Compounds			
Epichlorohydrin	-	-	0.1
Hexachlorobutadiene	-	-	0.0007
Monochloramine	-	-	3
Monocyclic Aromatic Hydrocarbons			
Benzene	950	500[C]	0.001
Toluene	-	-	0.8
Ethylbenzene	-	-	0.3
Xylenes	350 (as o-xylene) 200 (as p-xylene)	-	0.6
Styrene (Vinyl benzene)	-	-	0.03
Polycyclic Aromatic Hydrocarbons (PAHs)			
Naphthalene	16	50[C]	-
Benzo[a]pyrene	-	-	0.00001
Phenols			
Phenol	320	400	-
2-Chlorophenol	340[C]	-	0.3
4-Chlorophenol	220	-	-
2,4-Dichlorophenol	120	-	0.2
2,4,6-Trichlorophenol	3[D]	-	0.02
2,3,4,6-Tetrachlorophenol	10[D]	-	-
Pentachlorophenol	3.6[D]	11[D]	0.01

Substance	Groundwater Investigation Levels		
	Fresh Waters[A]	Marine Waters[A]	Drinking Water[B]
	(µg/L)	(µg/L)	(mg/L)
2,4-Dinitrophenol	45	-	-
Phthalates			
Dimethylphthalate	3700	-	-
Diethylphthalate	1000	-	-
Dibutylphthalate	10[D]	-	-
Di(2-ethylhexyl) phthalate	-	-	0.01
Pesticides			
Acephate	-	-	0.008
Aldicarb	-	-	0.004
Aldrin plus Dieldrin	-	-	0.0003
Ametryn	-	-	0.07
Amitraz	-	-	0.009
Amitrole	-	-	0.0009
Asulam	-	-	0.07
Atrazine	13	-	0.02
Azinphos-methyl	-	-	0.03
Benomyl	-	-	0.09
Bentazone	-	-	0.4
Bioresmethrin	-	-	0.1
Bromacil	-	-	0.4
Bromoxynil	-	-	0.01
Captan	-	-	0.4
Carbaryl	-	-	0.03
Carbendazim (Thiophanate-methyl)	-	-	0.09
Carbofuran	0.06	-	0.01
Carboxin	-	-	0.3
Carfentrazone-ethyl	-	-	0.1
Chlorantraniliprole	-	-	6
Chlordane	0.03[D]	-	0.002
Chlorfenvinphos	-	-	0.002
Chlorothalonil	-	-	0.05
Chlorpyrifos	0.01[D]	0.009[D]	0.01
Chlorsulfuron	-	-	0.2
Clopyralid	-	-	2

Substance	Groundwater Investigation Levels		
	Fresh Waters[A]	Marine Waters[A]	Drinking Water[B]
	(µg/L)	(µg/L)	(mg/L)
Cyfluthrin, Beta-cyfluthrin	-	-	0.05
Cypermethrin isomers	-	-	0.2
Cyprodinil	-	-	0.09
1,3-Dichloropropene	-	-	0.1
2,2-DPA	-	-	0.5
2,4-D [2,4-dichlorophenoxy acetic acid]	280	-	0.03
DDT	0.006[D]	-	0.009
Deltramethrin	-	-	0.04
Diazinon	0.01	-	0.004
Dicamba	-	-	0.1
Dichloroprop	-	-	0.1
Dichlorvos	-	-	0.005
Dicofol	-	-	0.004
Diclofop-methyl	-	-	0.005
Dieldrin plus Aldrin	-	-	0.0003
Diflubenzuron	-	-	0.07
Dimethoate	0.15	-	0.007
Diquat	1.4	-	0.007
Disulfoton	-	-	0.004
Diuron	-	-	0.02
Endosulfan	0.03[D]	0.005[D]	0.02
Endothal	-	-	0.1
Endrin	0.01[D]	0.004[D]	-
EPTC	-	-	0.3
Esfenvalerate	-	-	0.03
Ethion	-	-	0.004
Ethoprophos	-	-	0.001
Etridiazole	-	-	0.1
Fenamiphos	-	-	0.0005
Fenarimol	-	-	0.04
Fenitrothion	0.2	-	0.007
Fenthion	-	-	0.007
Fenvalerate	-	-	0.06
Fipronil	-	-	0.0007

Substance	Groundwater Investigation Levels		
	Fresh Waters[A]	Marine Waters[A]	Drinking Water[B]
	(µg/L)	(µg/L)	(mg/L)
Flamprop-methyl	-	-	0.004
Fluometuron	-	-	0.07
Flupropanate	-	-	0.009
Glyphosate	370	-	1
Haloxyfop	-	-	0.001
Heptachlor	0.01[D]	-	-
Heptachlor epoxide	-	-	0.0003
Hexazinone	-	-	0.4
Imazapyr	-	-	9
Iprodione	-	-	0.1
Lindane (γ-HCH)	0.2	-	0.01
Malathion	0.05	-	0.07
Mancozeb (as ETU, ethylene thiourea)	-	-	0.009
MCPA	-	-	0.04
Metaldehyde	-	-	0.02
Metham (as methylisothiocyanate, MITC)	-	-	0.001
Methidathion	-	-	0.006
Methiocarb	-	-	0.007
Methomyl	3.5		0.02
Methyl bromide	-	-	0.001
Metiram (as ETU, ethylene thiourea)	-	-	0.009
Metolachlor/s–Metolachlor	-	-	0.30
Metribuzin	-	-	0.07
Metsulfuron-methyl	-	-	0.04
Mevinphos	-	-	0.006
Molinate	3.4	-	0.004
Napropamide	-	-	0.4
Nicarbazin	-	-	1
Norflurazon	-	-	0.05
Omethoate	-	-	0.001
Oryzalin	-	-	0.4
Oxamyl	-	-	0.007

Substance	Groundwater Investigation Levels		
	Fresh Waters[A]	Marine Waters[A]	Drinking Water[B]
	(µg/L)	(µg/L)	(mg/L)
Paraquat	-	-	0.02
Parathion	0.004[C]	-	0.02
Parathion methyl	-	-	0.0007
Pebulate	-	-	0.03
Pendimethalin	-	-	0.4
Pentachlorophenol	-	-	0.01
Permethrin	-	-	0.2
Picloram	-	-	0.30
Piperonyl butoxide	-	-	0.6
Pirimicarb	-	-	0.007
Pirimiphos methyl	-	-	0.09
Polihexanide	-	-	0.7
Profenofos	-	-	0.0003
Propachlor	-	-	0.07
Propanil	-	-	0.7
Propargite	-	-	0.007
Proparzine	-	-	0.05
Propiconazole	-	-	0.1
Propyzamide	-	-	0.07
Pyrasulfatole	-	-	0.04
Pyrazophos	-	-	0.02
Pyroxsulam	-	-	4
Quintozene	-	-	0.03
Simazine	3.2	-	0.02
Spirotetramat	-	-	0.2
Sulprofos	-	-	0.01
2,4,5-T	36	-	0.1
Tebuthiuron	2.2	-	-
Temephos	-	0.05[D]	0.4
Terbacil	-	-	0.2
Terbufos	-	-	0.0009
Terbuthylazine	-	-	0.01
Terbutryn	-	-	0.4
Thiobencarb	2.8	-	0.04
Thiometon	-	-	0.004

Substance	Groundwater Investigation Levels		
	Fresh Waters[A]	Marine Waters[A]	Drinking Water[B]
	(µg/L)	(µg/L)	(mg/L)
Thiram	0.01	-	0.007
Toltrazuril	-	-	0.004
Toxafene	0.1 [D]	-	-
Triadimefon	-	-	0.09
Trichlorfon	-	-	0.007
Triclopyr	-	-	0.02
Trifluralin	2.6[D]	-	0.09
Vernolate	-	-	0.04
Surfactants			
Linear alkylbenzene sulfonates (LAS)	280	-	-
Alcohol ethoxylated sulfate (AES)	650	-	-
Alcohol ethoxylated surfactants (AE)	140	-	-

A Investigation levels apply to typical slightly-moderately disturbed systems. See ANZECC & ARMCANZ (2000) for guidance on applying these levels to different ecosystem conditions.

B Investigation levels are taken from the health values of the Australian Drinking Water Guidelines (NHMRC 2011).

C Figure may not protect key species from chronic toxicity, refer to ANZECC & ARMCANZ (2000) for further guidance.

D Chemical for which possible bioaccumulation and secondary poisoning effects should be considered, refer to ANZECC & ARMCANZ (2000) for further guidance.

E For changes in GIL with pH refer to ANZECC & ARMCANZ (2000) for further guidance.

H Values have been calculated using a hardness of 30 mg/L $CaCO_3$ refer to ANZECC & ARMCANZ (2000) for further guidance on recalculating for site-specific hardness.

US EPA Regional Screening Level Summary Table

November 2020

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; W = TEF applied; E = RPF applied; G = user's guide Section 5; M = mutagen; V = volatile; R = RBA applied ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded.

Toxicity and Chemical-specific Information												Contaminant		Screening Levels										Protection of Ground Water SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
				1.2E-03	O					1	0.1		Acephate	30560-19-1	7.6E+01	n	9.8E+02	n					2.4E+01	n		5.3E-03	n	
		2.2E-06	I			9.0E-03	I	V		1		1.1E+05	Acetaldehyde	75-07-0	1.1E+01	c**	4.9E+01	c**	1.3E+00	c**	5.6E+00	c**	2.6E+00	c**		5.2E-04	c**	
				2.0E-02	I					1	0.1		Acetochlor	34256-82-1	1.3E+03	n	1.6E+04	n					3.5E+02	n		2.8E-01	n	
				9.0E-01	I	3.1E+01	A	V		1		1.1E+05	Acetone	67-64-1	6.1E+04	n	6.7E+05	nms	3.2E+04	n	1.4E+05	n	1.4E+04	n		2.9E+00	n	
						2.0E-03	X			1	0.1		Acetone Cyanohydrin	75-86-5	2.8E+06	nm	1.2E+07	nm	2.1E+00	n	8.8E+00	n						
						6.0E-02	I	V		1		1.3E+05	Acetonitrile	75-05-8	8.1E+02	n	3.4E+03	n	6.3E+01	n	2.6E+02	n	1.3E+02	n		2.6E-02	n	
				1.0E-01	I			V		1		2.5E+03	Acetophenone	98-86-2	7.8E+03	ns	1.2E+05	nms					1.9E+03	n		5.8E-01	n	
3.8E+00	C	1.3E-03	C							1	0.1		Acetylaminofluorene, 2-	53-96-3	1.4E-01	c	6.0E-01	c	2.2E-03	c	9.4E-03	c	1.6E-02	c		7.5E-05	c	
				5.0E-04	I	2.0E-05	I	V		1		2.3E+04	Acrolein	107-02-8	1.4E-01	n	6.0E-01	n	2.1E-02	n	8.8E-02	n	4.2E-02	n		8.4E-06	n	
5.0E-01	I	1.0E-04	I	2.0E-03	I	6.0E-03	I		M	1	0.1		Acrylamide	79-06-1	2.4E-01	c	4.6E+00	c	1.0E-02	c	1.2E-01	c	5.0E-02	c		1.1E-05	c	
				5.0E-01	I	1.0E-03	I	V		1		1.1E+05	Acrylic Acid	79-10-7	9.9E+01	n	4.2E+02	n	1.0E+00	n	4.4E+00	n	2.1E+00	n		4.2E-04	n	
5.4E-01	I	6.8E-05	I	4.0E-02	A	2.0E-03	I	V		1		1.1E+04	Acrylonitrile	107-13-1	2.5E-01	c*	1.1E+00	c*	4.1E-02	c*	1.8E-01	c*	5.2E-02	c*		1.1E-05	c*	
						6.0E-03	P			1	0.1		Adiponitrile	111-69-3	8.5E+06	nm	3.6E+07	nm	6.3E+00	n	2.6E+01	n						
5.6E-02	C			1.0E-02	I					1	0.1		Alachlor	15972-60-8	9.7E+00	c*	4.1E+01	c					1.1E+00	c	2.0E+00	8.7E-04	c	1.6E-03
				1.0E-03	I					1	0.1		Aldicarb	116-06-3	6.3E+01	n	8.2E+02	n					2.0E+01	n	3.0E+00	4.9E-03	n	7.5E-04
				1.0E-03	I					1	0.1		Aldicarb Sulfone	1646-88-4	6.3E+01	n	8.2E+02	n					2.0E+01	n	2.0E+00	4.4E-03	n	4.4E-04
										1	0.1		Aldicarb sulfoxide	1646-87-3											4.0E+00			8.8E-04
1.7E+01	I	4.9E-03	I	3.0E-05	I			V		1			Aldrin	309-00-2	3.9E-02	c*	1.8E-01	c	5.7E-04	c	2.5E-03	c	9.2E-04	c		1.5E-04	c	
				5.0E-03	I	1.0E-04	X	V		1		1.1E+05	Allyl Alcohol	107-18-6	3.5E+00	n	1.5E+01	n	1.0E-01	n	4.4E-01	n	2.1E-01	n		4.2E-05	n	
2.1E-02	C	6.0E-06	C			1.0E-03	I	V		1		1.4E+03	Allyl Chloride	107-05-1	7.2E-01	c**	3.2E+00	c**	4.7E-01	c**	2.0E+00	c**	7.3E-01	c**		2.3E-04	c**	
				1.0E+00	P	5.0E-03	P			1			Aluminum	7429-90-5	7.7E+04	n	1.1E+06	nm	5.2E+00	n	2.2E+01	n	2.0E+04	n		3.0E+04	n	
				4.0E-04	I					1			Aluminum Phosphide	20859-73-8	3.1E+01	n	4.7E+02	n					8.0E+00	n				
				9.0E-03	I					1	0.1		Ametryn	834-12-8	5.7E+02	n	7.4E+03	n					1.5E+02	n		1.6E-01	n	
2.1E+01	C	6.0E-03	C							1	0.1		Aminobiphenyl, 4-	92-67-1	2.6E-02	c	1.1E-01	c	4.7E-04	c	2.0E-03	c	3.0E-03	c		1.5E-05	c	
				8.0E-02	P					1	0.1		Aminophenol, m-	591-27-5	5.1E+03	n	6.6E+04	n					1.6E+03	n		6.1E-01	n	
				4.0E-03	X					1	0.1		Aminophenol, o-	95-55-6	2.5E+02	n	3.3E+03	n					7.9E+01	n		3.0E-02	n	
				2.0E-02	P					1	0.1		Aminophenol, p-	123-30-8	1.3E+03	n	1.6E+04	n					4.0E+02	n		1.5E-01	n	
				2.5E-03	I					1	0.1		Amitraz	33089-61-1	1.6E+02	n	2.1E+03	n					8.2E+00	n		4.2E+00	n	
						5.0E-01	I	V		1			Ammonia	7664-41-7					5.2E+02	n	2.2E+03	n						
				2.0E-03	X					1	0.1		Ammonium Picrate	131-74-8	1.3E+02	n	1.6E+03	n					4.0E+01	n		1.9E-01	n	
				2.0E-01	I					1			Ammonium Sulfamate	7773-06-0	1.6E+04	n	2.3E+05	nm					4.0E+03	n				
						3.0E-03	X	V		1		1.4E+04	Amyl Alcohol, tert-	75-85-4	8.2E+01	n	3.4E+02	n	3.1E+00	n	1.3E+01	n	6.3E+00	n		1.3E-03	n	
5.7E-03	I	1.6E-06	C	7.0E-03	P	1.0E-03	I			1	0.1		Aniline	62-53-3	9.5E+01	c**	4.0E+02	c*	1.0E+00	n	4.4E+00	n	1.3E+01	c*		4.6E-03	c*	
4.0E-02	P			2.0E-03	X					1	0.1		Anthraquinone, 9,10-	84-65-1	1.4E+01	c**	5.7E+01	c*					1.4E+00	c*		1.4E-02	c*	
				4.0E-04	I	3.0E-04	A			0.15			Antimony (metallic)	7440-36-0	3.1E+01	n	4.7E+02	n	3.1E-01	n	1.3E+00	n	7.8E+00	n	6.0E+00	3.5E-01	n	2.7E-01
				5.0E-04	H					0.15			Antimony Pentoxide	1314-60-9	3.9E+01	n	5.8E+02	n					9.7E+00	n				
				4.0E-04	H					0.15			Antimony Tetroxide	1332-81-6	3.1E+01	n	4.7E+02	n					7.8E+00	n				
						2.0E-04	I			0.15			Antimony Trioxide	1309-64-4	2.8E+05	nm	1.2E+06	nm	2.1E-01	n	8.8E-01	n						
1.5E+00	I	4.3E-03	I	3.0E-04	I	1.5E-05	C			1	0.03		Arsenic, Inorganic	7440-38-2	6.8E-01	c*R	3.0E+00	cR	6.5E-04	c*	2.9E-03	c*	5.2E-02	c	1.0E+01	1.5E-03	c	2.9E-01
				3.5E-06	C	5.0E-05	I			1			Arsine	7784-42-1	2.7E-01	n	4.1E+00	n	5.2E-02	n	2.2E-01	n	7.0E-02	n				
										1			Asbestos (units in fibers)	1332-21-4											7.0E+06(G)			
				3.6E-02	O					1	0.1		Asulam	3337-71-1	2.3E+03	n	3.0E+04	n					7.2E+02	n		1.8E-01	n	
2.3E-01	C			3.5E-02	I					1	0.1		Atrazine	1912-24-9	2.4E+00	c	1.0E+01	c					3.0E-01	c	3.0E+00	2.0E-04	c	1.9E-03
8.8E-01	C	2.5E-04	C							1	0.1		Auramine	492-80-8	6.2E-01	c	2.6E+00	c	1.1E-02	c	4.9E-02	c	7.8E-02	c		7.1E-04	c	
				4.0E-04	I					1	0.1		Avermectin B1	65195-55-3	2.5E+01	n	3.3E+02	n					8.0E+00	n		1.4E+01	n	
				3.0E-03	A	1.0E-02	A			1	0.1		Azinphos-methyl	86-50-0	1.9E+02	n	2.5E+03	n	1.0E+01	n	4.4E+01	n	5.6E+01	n		1.7E-02	n	
1.1E-01	I	3.1E-05	I					V		1			Azobenzene	103-33-3	5.6E+00	c	2.6E+01	c	9.1E-02	c	4.0E-01	c	1.2E-01	c		9.3E-04	c	
				1.0E+00	P	7.0E-06	P			1	0.1		Azodicarbonamide	123-77-3	8.6E+03	n	4.0E+04	n	7.3E-03	n	3.1E-02	n	2.0E+04	n		6.8E+00	n	
				2.0E-01	I	5.0E-04	H			0.07			Barium	7440-39-3	1.5E+04	n	2.2E+05	nm	5.2E-01	n	2.2E+00	n	3.8E+03	n	2.0E+03	1.6E+02	n	8.2E+01
				5.0E-03	O			V		1			Benfluralin	1861-40-1	3.9E+02	n	5.8E+03	n					2.8E+01	n		9.4E-01	n	
				5.0E-02	I					1	0.1		Benomyl	17804-35-2	3.2E+03	n	4.1E+04	n					9.7E+02	n		8.5E-01	n	
				2.0E-01	I					1	0.1		Bensulfuron-methyl	83055-99-6	1.3E+04	n	1.6E+05	nm					3.9E+03	n		1.0E+00	n	
				3.0E-02	I					1	0.1		Bentazon	25057-89-0	1.9E+03	n	2.5E+04	n					5.7E+02	n		1.2E-01	n	
4.0E-03	P			1.0E-01	I			V		1		1.2E+03	Benzaldehyde	100-52-7	1.7E+02	c*	8.2E+02	c					1.9E+01	c		4.1E-03	c	
5.5E-02	I	7.8E-06	I	4.0E-03	I	3.0E-02	I	V		1		1.8E+03	Benzene	71-43-2	1.2E+00	c*	5.1E+00	c*	3.6E-01	c*	1.6E+00	c*	4.6E-01	c*	5.0E+00	2.3E-04	c*	2.6E-03
1.0E-01	X			3.0E-04	X					1	0.1		Benzenediamine-2-methyl sulfate, 1,4-	6369-59-1	5.4E+00	c**	2.3E+01	c*					7.8E-01	c**		2.2E-04	c**	
				1.0E-03	P			V		1		1.3E+03	Benzenethiol	108-98-5	7.8E+01	n	1.2E+03	n					1.7E+01	n		1.1E-02	n	
2.3E+02	I	6.7E-02	I	3.0E-03	I				M	1	0.1		Benzidine	92-87-5	5.3E-04	c	1.0E-02	c	1.5E-05	c	1.8E-04	c	1.1E-04	c		2.8E-07	c	
				4.0E+00	I					1	0.1		Benzoic Acid	65-85-0	2.5E+05	nm	3.3E+06	nm					7.5E+04	n		1.5E+01	n	
1.3E+01	I							V		1		3.2E+02	Benzotrichloride	98-07-7	5.3E-02	c	2.5E-01	c					3.0E-03	c		6.6E-06	c	
				1.0E-01	P					1	0.1		Benzyl Alcohol	100-51-6	6.3E+03	n	8.2E+04	n					2.0E+03	n		4.8E-01	n	
1.7E-01	I	4.9E-05	C	2.0E-03	P	1.0E-03	P	V		1		1.5E+03	Benzyl Chloride	100-44-7	1.1E+00	c*	4.8E+00	c*	5.7E-02	c*	2.5E-01	c*	8.9E-02	c*		9.8E-05	c*	
		2.4E-03	I	2.0E-03	I	2.0E-05	I			0.007			Beryllium and compounds	7440-41-7	1.6E+02	n	2.3E+03	n	1.2E-03	c*	5.1E-03	c*	2.5E+01	n	4.0E+00	1.9E+01	n	3.2E+00
				9.0E-03	P					1	0.1		Bifenox	42576-02-3	5.7E+02	n	7.4E+03	n					1.0E+02	n		7.6E-01	n	
				1.5E-02	I					1	0.1		Biphenthrin	82657-04-3	9.5E+02	n	1.2E+04	n					3.0E+02	n		1.4E+03	n	
8.0E-03	I			5.0E-01	I	4.0E-04	X	V		1			Biphenyl, 1,1'-	92-52-4	4.7E+01	n	2.0E+02	n	4.2E-01	n	1.8E+00	n	8.3E-01	n		8.7E-03	n	
				4.0E-02	I			V		1		1.0E+03	Bis(2-chloro-1-methylethyl) ether	108-60-1	3.1E+03	ns	4.7E+04	ns					7.1E+02	n		2.6E-01	n	
				3.0E-03	P					1	0.1		Bis(2-chloroethoxy)methane	111-91-1	1.9E+02	n	2.5E+03	n					5.9E+01	n		1.3E-02	n	
1.1E+00	I	3.3E-04	I					V		1		5.1E+03	Bis(2-chloroethyl)ether	111-44-4	2.3E-01	c	1.0E+00	c	8.5E-03	c	3.7E-02	c	1.4E-02	c		3.6E-06	c	
2.2E+02	I	6.2E-02	I					V		1		4.2E+03	Bis(chloromethyl)ether	542-88-1	8.3E-05	c	3.6E-04	c	4.5E-05	c	2.0E-04	c	7.2E-05	c		1.7E-08	c	
				5.0E-02	I					1	0.1		Bisphenol A	80-05-7	3.2E+03	n	4.1E+04	n					7.7E+02	n		5.8E+01	n	
				2.0E-01	I	2.0E-02	H			1			Boron And Borates Only	7440-42-8	1.6E+04	n	2.3E+05	nm	2.1E+01	n	8.8E+01	n	4.0E+03	n		1.3E+01	n	
				2.0E+00	P	2.0E-02	P	V		1			Boron Trichloride	10294-34-5	1.6E+05	nm	2.3E+06	nm	2.1E+01	n	8.8E+01	n	4.2E+01	n				
				4.0E-02	C	1.3E-02	C	V		1			Boron Trifluoride	7637-07-2	3.1E+03	n	4.7E+04	n	1.4E+01	n	5.7E+01	n	2.6E+01	n				
7.0E-01	I			4.0E-03	I					1			Bromate	15541-45-4	9.9E-01	c	4.7E+00	c					1.1E-01	c	1.0E+01	8.5E-04	c	7.7E-02
2.0E+00	X	6.0E-04	X					V		1		2.4E+03	Bromo-2-chloroethane, 1-	107-04-0	2.6E-02	c	1.1E-01	c	4.7E-03	c	2.0E-02	c	7.4E-03	c		2.1E-06	c	
				3.0E-04	X			V		1		9.0E+02	Bromo-3-fluorobenzene, 1-	1073-06-9	2.3E+01	n	3.5E+02	n					4.9E+00	n		4.7E-03	n	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; W = TEF applied; E = RPF applied; G = user's guide Section 5; M = mutagen; V = volatile; R = RBA applied ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded.

Toxicity and Chemical-specific Information												Contaminant		Screening Levels												Protection of Ground Water SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	volatile	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
				3.0E-04	X			V		1		3.2E+02	Bromo-4-fluorobenzene, 1-	460-00-4	2.3E+01	n	3.5E+02	ns					4.6E+00	n		4.4E-03	n	
										1	0.1		Bromoacetic acid	79-08-3											6.0E+01(G)			1.2E-02
				8.0E-03	I	6.0E-02	I	V		1		6.8E+02	Bromobenzene	108-86-1	2.9E+02	n	1.8E+03	ns	6.3E+01	n	2.6E+02	n	6.2E+01	n		4.2E-02	n	
						4.0E-02	X	V		1		4.0E+03	Bromochloromethane	74-97-5	1.5E+02	n	6.3E+02	n	4.2E+01	n	1.8E+02	n	8.3E+01	n		2.1E-02	n	
6.2E-02	I	3.7E-05	C	2.0E-02	I			V		1		9.3E+02	Bromodichloromethane	75-27-4	2.9E-01	c	1.3E+00	c	7.6E-02	c	3.3E-01	c	1.3E-01	c	8.0E+01(G)	3.6E-05	c	2.2E-02
7.9E-03	I	1.1E-06	I	2.0E-02	I			V		1		9.2E+02	Bromoform	75-25-2	1.9E+01	c*	8.6E+01	c	2.6E+00	c	1.1E+01	c	3.3E+00	c	8.0E+01(G)	8.7E-04	c	2.1E-02
				1.4E-03	I	5.0E-03	I	V		1		3.6E+03	Bromomethane	74-83-9	6.8E+00	n	3.0E+01	n	5.2E+00	n	2.2E+01	n	7.5E+00	n		1.9E-03	n	
				5.0E-03	H			V		1			Bromophos	2104-96-3	3.9E+02	n	5.8E+03	n					3.5E+01	n		1.5E-01	n	
						1.0E-01	A	V		1		9.7E+02	Bromopropane, 1-	106-94-5	2.2E+02	n	9.4E+02	n	1.0E+02	n	4.4E+02	n	2.1E+02	n		6.4E-02	n	
1.0E-01	O			1.5E-02	O					1	0.1		Bromoxynil	1689-84-5	5.3E+00	c	2.2E+01	c					6.1E-01	c		5.2E-04	c	
1.0E-01	O			1.5E-02	O			V		1			Bromoxynil Octanoate	1689-99-2	6.7E+00	c	3.2E+01	c					2.4E-01	c		2.1E-03	c	
6.0E-01	C	3.0E-05	I			2.0E-03	I	V		1		6.7E+02	Butadiene, 1,3-	106-99-0	7.6E-02	c*	3.3E-01	c*	9.4E-02	c*	4.1E-01	c*	7.1E-02	c*		3.9E-05	c*	
				3.0E-02	O					1	0.1		Butanoic acid, 4-(2,4-dichlorophenoxy)-	94-82-6	1.9E+03	n	2.5E+04	n					4.5E+02	n		4.2E-01	n	
				1.0E-01	I			V		1		7.6E+03	Butanol, N-	71-36-3	7.8E+03	ns	1.2E+05	nms					2.0E+03	n		4.1E-01	n	
				2.0E+00	P	3.0E+01	P	V		1		2.1E+04	Butyl alcohol, sec-	78-92-2	1.3E+05	nms	1.5E+06	nms	3.1E+04	n	1.3E+05	n	2.4E+04	n		5.0E+00	n	
				5.0E-02	I			V		1			Butylate	2008-41-5	3.9E+03	n	5.8E+04	n					4.6E+02	n		4.5E-01	n	
2.0E-04	C	5.7E-08	C							1	0.1		Butylated hydroxyanisole	25013-16-5	2.7E+03	c	1.1E+04	c	4.9E+01	c	2.2E+02	c	1.5E+02	c		2.9E-01	c	
3.6E-03	P			3.0E-01	P					1	0.1		Butylated hydroxytoluene	128-37-0	1.5E+02	c	6.4E+02	c					3.4E+00	c		1.0E-01	c	
				5.0E-02	P			V		1		1.1E+02	Butylbenzene, n-	104-51-8	3.9E+03	ns	5.8E+04	ns					1.0E+03	n		3.2E+00	n	
				1.0E-01	X			V		1		1.5E+02	Butylbenzene, sec-	135-98-8	7.8E+03	ns	1.2E+05	nms					2.0E+03	n		5.9E+00	n	
				1.0E-01	X			V		1		1.8E+02	Butylbenzene, tert-	98-06-6	7.8E+03	ns	1.2E+05	nms					6.9E+02	n		1.6E+00	n	
				2.0E-02	A					1	0.1		Cacodylic Acid	75-60-5	1.3E+03	n	1.6E+04	n					4.0E+02	n		1.1E-01	n	
		1.8E-03	I	1.0E-03	I	1.0E-05	A			0.025	0.001		Cadmium (Diet)	7440-43-9	7.1E+01	n	9.8E+02	n										
		1.8E-03	I	5.0E-04	I	1.0E-05	A			0.05	0.001		Cadmium (Water)	7440-43-9					1.6E-03	c**	6.8E-03	c**	9.2E+00	n	5.0E+00	6.9E-01	n	3.8E-01
				5.0E-01	I	2.2E-03	C			1	0.1		Caprolactam	105-60-2	3.1E+04	n	4.0E+05	nm	2.3E+00	n	9.6E+00	n	9.9E+03	n		2.5E+00	n	
1.5E-01	C	4.3E-05	C	2.0E-03	I					1	0.1		Captafol	2425-06-1	3.6E+00	c*	1.5E+01	c	6.5E-02	c	2.9E-01	c	4.0E-01	c*		7.1E-04	c*	
2.3E-03	C	6.6E-07	C	1.3E-01	I					1	0.1		Captan	133-06-2	2.4E+02	c*	1.0E+03	c	4.3E+00	c	1.9E+01	c	3.1E+01	c*		2.2E-02	c*	
				1.0E-01	I					1	0.1		Carbaryl	63-25-2	6.3E+03	n	8.2E+04	n					1.8E+03	n		1.7E+00	n	
				5.0E-03	I					1	0.1		Carbofuran	1563-66-2	3.2E+02	n	4.1E+03	n					9.4E+01	n	4.0E+01	3.7E-02	n	1.6E-02
				1.0E-01	I	7.0E-01	I	V		1		7.4E+02	Carbon Disulfide	75-15-0	7.7E+02	ns	3.5E+03	ns	7.3E+02	n	3.1E+03	n	8.1E+02	n		2.4E-01	n	
7.0E-02	I	6.0E-06	I	4.0E-03	I	1.0E-01	I	V		1		4.6E+02	Carbon Tetrachloride	56-23-5	6.5E-01	c	2.9E+00	c	4.7E-01	c	2.0E+00	c	4.6E-01	c	5.0E+00	1.8E-04	c	1.9E-03
						1.0E-01	P	V		1		5.9E+03	Carbonyl Sulfide	463-58-1	6.7E+01	n	2.8E+02	n	1.0E+02	n	4.4E+02	n	2.1E+02	n		5.1E-01	n	
				1.0E-02	I					1	0.1		Carbosulfan	55285-14-8	6.3E+02	n	8.2E+03	n					5.1E+01	n		1.2E+00	n	
				1.0E-01	I					1	0.1		Carboxin	5234-68-4	6.3E+03	n	8.2E+04	n					1.9E+03	n		1.0E+00	n	
						9.0E-04	I			1			Ceric oxide	1306-38-3	1.3E+06	nm	5.4E+06	nm	9.4E-01	n	3.9E+00	n						
				1.0E-01	I			V		1			Chloral Hydrate	302-17-0	7.8E+03	n	1.2E+05	nm					2.0E+03	n		4.0E-01	n	
				1.5E-02	I					1	0.1		Chloramben	133-90-4	9.5E+02	n	1.2E+04	n					2.9E+02	n		7.0E-02	n	
													Chloramines, Organic	E701235											4.0E+03(G)		
4.0E-01	H									1	0.1		Chloranil	118-75-2	1.3E+00	c	5.7E+00	c					1.8E-01	c		1.5E-04	c	
3.5E-01	I	1.0E-04	I	5.0E-04	I	7.0E-04	I	V		1	0.04		Chlordane (technical mixture)	12789-03-6	1.7E+00	c*	7.7E+00	c*	2.8E-02	c*	1.2E-01	c*	2.0E-02	c*	2.0E+00	2.7E-03	c*	2.7E-01
1.0E+01	I	4.6E-03	C	3.0E-04	I					1	0.1		Chlordecone (Kepone)	143-50-0	5.4E-02	c	2.3E-01	c	6.1E-04	c	2.7E-03	c	3.5E-03	c		1.2E-04	c	
				7.0E-04	A					1	0.1		Chlorfenvinphos	470-90-6	4.4E+01	n	5.7E+02	n					1.1E+01	n		3.1E-02	n	
				9.0E-02	O					1	0.1		Chlorimuron, Ethyl-	90982-32-4	5.7E+03	n	7.4E+04	n					1.8E+03	n		6.0E-01	n	
				1.0E-01	I	1.5E-04	A	V		1		2.8E+03	Chlorine	7782-50-5	1.8E-01	n	7.8E-01	n	1.5E-01	n	6.4E-01	n	3.0E-01	n	4.0E+03(G)	1.5E-04	n	2.0E+00
				3.0E-02	I	2.0E-04	I	V		1			Chlorine Dioxide	10049-04-4	2.3E+03	n	3.4E+04	n	2.1E-01	n	8.8E-01	n	4.2E-01	n	8.0E+02(G)			
				3.0E-02	I					1			Chlorite (Sodium Salt)	7758-19-2	2.3E+03	n	3.5E+04	n					6.0E+02	n	1.0E+03			
						5.0E+01	I	V		1		1.2E+03	Chloro-1,1-difluoroethane, 1-	75-68-3	5.4E+04	ns	2.3E+05	nms	5.2E+04	n	2.2E+05	n	1.0E+05	n		5.2E+01	n	
		3.0E-04	I	2.0E-02	H	2.0E-02	I	V		1		7.9E+02	Chloro-1,3-butadiene, 2-	126-99-8	1.0E-02	c	4.4E-02	c	9.4E-03	c	4.1E-02	c	1.9E-02	c		9.8E-06	c	
4.6E-01	H									1	0.1		Chloro-2-methylaniline HCl, 4-	3165-93-3	1.2E+00	c	5.0E+00	c					1.7E-01	c		1.5E-04	c	
1.0E-01	P	7.7E-05	C	3.0E-03	X					1	0.1		Chloro-2-methylaniline, 4-	95-69-2	5.4E+00	c*	2.3E+01	c	3.6E-02	c	1.6E-01	c	7.0E-01	c*		4.0E-04	c*	
2.7E-01	X							V		1		1.2E+04	Chloroacetaldehyde, 2-	107-20-0	2.6E+00	c	1.2E+01	c					2.9E-01	c		5.8E-05	c	
										1	0.1		Chloroacetic Acid	79-11-8											6.0E+01(G)			1.2E-02
						3.0E-05	I			1	0.1		Chloroacetophenone, 2-	532-27-4	4.3E+04	n	1.8E+05	nm	3.1E-02	n	1.3E-01	n						
2.0E-01	P			4.0E-03	I					1	0.1		Chloroaniline, p-	106-47-8	2.7E+00	c*	1.1E+01	c					3.7E-01	c		1.6E-04	c	
				2.0E-02	I	5.0E-02	P	V		1		7.6E+02	Chlorobenzene	108-90-7	2.8E+02	n	1.3E+03	ns	5.2E+01	n	2.2E+02	n	7.8E+01	n	1.0E+02	5.3E-02	n	6.8E-02
				1.0E-01	X					1	0.1		Chlorobenzene sulfonic acid, p-	98-66-8	6.3E+03	n	8.2E+04	n					2.0E+03	n		4.7E-01	n	
1.1E-01	C	3.1E-05	C	2.0E-02	I					1	0.1		Chlorobenzilate	510-15-6	4.9E+00	c	2.1E+01	c	9.1E-02	c	4.0E-01	c	3.1E-01	c		1.0E-03	c	
				3.0E-02	X					1	0.1		Chlorobenzoic Acid, p-	74-11-3	1.9E+03	n	2.5E+04	n					5.1E+02	n		1.3E-01	n	
		8.6E-06	C	3.0E-03	P	3.0E-01	P	V		1		2.9E+02	Chlorobenzotrifluoride, 4-	98-56-6	2.2E+00	c*	9.6E+00	c	3.3E-01	c	1.4E+00	c	6.5E-01	c*		2.3E-03	c*	
				4.0E-02	P			V		1		7.3E+02	Chlorobutane, 1-	109-69-3	3.1E+03	ns	4.7E+04	ns					6.4E+02	n		2.6E-01	n	
						5.0E+01	I	V		1		1.7E+03	Chlorodifluoromethane	75-45-6	4.9E+04	ns	2.1E+05	nms	5.2E+04	n	2.2E+05	n	1.0E+05	n		4.3E+01	n	
				2.0E-02	P			V		1		1.1E+05	Chloroethanol, 2-	107-07-3	1.6E+03	n	2.3E+04	n					4.0E+02	n		8.1E-02	n	
3.1E-02	C	2.3E-05	I	1.0E-02	I	9.8E-02	A	V		1		2.5E+03	Chloroform	67-66-3	3.2E-01	c	1.4E+00	c	1.2E-01	c	5.3E-01	c	2.2E-01	c	8.0E+01(G)	6.1E-05	c	2.2E-02
						9.0E-02	I	V		1		1.3E+03	Chloromethane	74-87-3	1.1E+02	n	4.6E+02	n	9.4E+01	n	3.9E+02	n	1.9E+02	n		4.9E-02	n	
2.4E+00	C	6.9E-04	C					V		1		9.3E+03	Chloromethyl Methyl Ether	107-30-2	2.0E-02	c	8.9E-02	c	4.1E-03	c	1.8E-02	c	6.5E-03	c		1.4E-06	c	
3.0E-01	P			3.0E-03	P	1.0E-05	X			1	0.1		Chloronitrobenzene, o-	88-73-3	1.8E+00	c	7.7E+00	c	1.0E-02	n	4.4E-02	n	2.4E-01	c		2.2E-04	c	
6.0E-02	P			7.0E-04	P	2.0E-03	P			1	0.1		Chloronitrobenzene, p-	100-00-5	9.0E+00	c**	3.8E+01	c*	2.1E+00	n	8.8E+00	n	1.2E+00	c*		1.1E-03	c*	
				5.0E-03	I			V		1		2.7E+04	Chlorophenol, 2-	95-57-8	3.9E+02	n	5.8E+03	n					9.1E+01	n		8.9E-02	n	
						4.0E-04	C	V		1		6.2E+02	Chloropicrin	76-06-2	2.0E+00	n	8.2E+00	n	4.2E-01	n	1.8E+00	n	8.3E-01	n		2.5E-04	n	
1.7E-02	C			1.5E-02	I					1	0.1		Chlorothalonil	1897-45-6	3.2E+01	c*	1.4E+02	c*					4.0E+00	c*		9.0E-03	c*	
				2.0E-02	I			V		1		9.1E+02	Chlorotoluene, o-	95-49-8	1.6E+03	ns	2.3E+04	ns					2.4E+02	n		2.3E-01	n	
				2.0E-02	X			V		1		2.5E+02	Chlorotoluene, p-	106-43-4	1.6E+03	ns	2.3E+04	ns					2.5E+02	n		2.4E-01	n	
2.4E+02	C	6.9E-02	C							1	0.1		Chlorozotocin	54749-90-5	2.3E-03	c	9.6E-03	c	4.1E-05	c	1.8E-04	c	3.2E-04	c		7.1E-08	c	
				5.0E-02	O					1	0.1		Chlorpropham	101-21-3	3.2E+03	n	4.1E+04	n					7.1E+02	n		6.4E-01	n	
				1.0E-03	A					1	0.1		Chlorpyrifos	2921-88-2	6.3E+01	n	8.2E+02	n					8.4E+00	n		1.2E-01	n	
				1.0E-02	H					1	0.1		Chlorpyrifos Methyl	5598-13-0	6.3E+02	n	8.2E+03	n					1.2E+02	n		5.4E-01	n	
				5.0E-02	O					1	0.1		Chlorsulfuron	64902-72-3	3.2E+03	n	4.1E+04	n					9.9E+02	n		8.3E-01	n	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; W = TEF applied; E = RPF applied; G = user's guide Section 5; M = mutagen; V = volatile; R = RBA applied ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded.

Toxicity and Chemical-specific Information												Contaminant		Screening Levels										Protection of Ground Water SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	volatile	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
				1.0E-02	I					1	0.1		Chlorthal-dimethyl	1861-32-1	6.3E+02	n	8.2E+03	n					1.2E+02	n		1.5E-01	n	
				8.0E-04	H					1	0.1		Chlorthiophos	60238-56-4	5.1E+01	n	6.6E+02	n					2.8E+00	n		7.3E-02	n	
				1.5E+00	I					0.013			Chromium(III), Insoluble Salts	16065-83-1	1.2E+05	nm	1.8E+06	nm					2.2E+04	n		4.0E+07	n	
5.0E-01	C	8.4E-02	G	3.0E-03	I	1.0E-04	I		M	0.025			Chromium(VI)	18540-29-9	3.0E-01	c	6.3E+00	c	1.2E-05	c	1.5E-04	c	3.5E-02	c		6.7E-04	c	
										0.013			Chromium, Total	7440-47-3											1.0E+02			1.8E+05
				1.3E-02	I					1	0.1		Clofentezine	74115-24-5	8.2E+02	n	1.1E+04	n					2.3E+02	n		1.4E+01	n	
		9.0E-03	P	3.0E-04	P	6.0E-06	P			1			Cobalt	7440-48-4	2.3E+01	n	3.5E+02	n	3.1E-04	c*	1.4E-03	c*	6.0E+00	n		2.7E-01	n	
		6.2E-04	I					V	M	1			Coke Oven Emissions	E649830					1.6E-03	c	2.0E-02	c						
				4.0E-02	H					1			Copper	7440-50-8	3.1E+03	n	4.7E+04	n					8.0E+02	n	1.3E+03	2.8E+01	n	4.6E+01
				5.0E-02	I	6.0E-01	C			1	0.1		Cresol, m-	108-39-4	3.2E+03	n	4.1E+04	n	6.3E+02	n	2.6E+03	n	9.3E+02	n		7.4E-01	n	
				5.0E-02	I	6.0E-01	C			1	0.1		Cresol, o-	95-48-7	3.2E+03	n	4.1E+04	n	6.3E+02	n	2.6E+03	n	9.3E+02	n		7.5E-01	n	
				1.0E-01	A	6.0E-01	C			1	0.1		Cresol, p-	106-44-5	6.3E+03	n	8.2E+04	n	6.3E+02	n	2.6E+03	n	1.9E+03	n		1.5E+00	n	
				1.0E-01	A					1	0.1		Cresol, p-chloro-m-	59-50-7	6.3E+03	n	8.2E+04	n					1.4E+03	n		1.7E+00	n	
				1.0E-01	A	6.0E-01	C			1	0.1		Cresols	1319-77-3	6.3E+03	n	8.2E+04	n	6.3E+02	n	2.6E+03	n	1.5E+03	n		1.3E+00	n	
1.9E+00	H			1.0E-03	P			V		1		1.7E+04	Crotonaldehyde, trans-	123-73-9	3.7E-01	c	1.7E+00	c					4.0E-02	c		8.2E-06	c	
				1.0E-01	I	4.0E-01	I	V		1		2.7E+02	Cumene	98-82-8	1.9E+03	ns	9.9E+03	ns	4.2E+02	n	1.8E+03	n	4.5E+02	n		7.4E-01	n	
2.2E-01	C	6.3E-05	C							1	0.1		Cupferron	135-20-6	2.5E+00	c	1.0E+01	c	4.5E-02	c	1.9E-01	c	3.5E-01	c		6.1E-04	c	
8.4E-01	H			2.0E-03	H					1	0.1		Cyanazine	21725-46-2	6.5E-01	c	2.7E+00	c					8.8E-02	c		4.1E-05	c	
													Cyanides															
				1.0E-03	I					1			~Calcium Cyanide	592-01-8	7.8E+01	n	1.2E+03	n					2.0E+01	n				
				5.0E-03	I					1			~Copper Cyanide	544-92-3	3.9E+02	n	5.8E+03	n					1.0E+02	n				
				6.0E-04	I	8.0E-04	G	V		1		9.5E+05	~Cyanide (CN-)	57-12-5	2.3E+01	n	1.5E+02	n	8.3E-01	n	3.5E+00	n	1.5E+00	n	2.0E+02	1.5E-02	n	2.0E+00
				1.0E-03	I			V		1			~Cyanogen	460-19-5	7.8E+01	n	1.2E+03	n					2.0E+01	n				
				9.0E-02	I			V		1			~Cyanogen Bromide	506-68-3	7.0E+03	n	1.1E+05	nm					1.8E+03	n				
				5.0E-02	I			V		1			~Cyanogen Chloride	506-77-4	3.9E+03	n	5.8E+04	n					1.0E+03	n				
				6.0E-04	I	8.0E-04	I	V		1		1.0E+07	~Hydrogen Cyanide	74-90-8	2.3E+01	n	1.5E+02	n	8.3E-01	n	3.5E+00	n	1.5E+00	n		1.5E-02	n	
				2.0E-03	I					1			~Potassium Cyanide	151-50-8	1.6E+02	n	2.3E+03	n					4.0E+01	n				
				5.0E-03	I					0.04			~Potassium Silver Cyanide	506-61-6	3.9E+02	n	5.8E+03	n					8.2E+01	n				
				1.0E-01	I					0.04			~Silver Cyanide	506-64-9	7.8E+03	n	1.2E+05	nm					1.8E+03	n				
				1.0E-03	I					1			~Sodium Cyanide	143-33-9	7.8E+01	n	1.2E+03	n					2.0E+01	n	2.0E+02			
				2.0E-04	P					1			~Thiocyanates	E1790664	1.6E+01	n	2.3E+02	n					4.0E+00	n				
				2.0E-04	X			V		1			~Thiocyanic Acid	463-56-9	1.6E+01	n	2.3E+02	n					4.0E+00	n				
				5.0E-02	I					1			~Zinc Cyanide	557-21-1	3.9E+03	n	5.8E+04	n					1.0E+03	n				
						6.0E+00	I	V		1		1.2E+02	Cyclohexane	110-82-7	6.5E+03	ns	2.7E+04	ns	6.3E+03	n	2.6E+04	n	1.3E+04	n		1.3E+01	n	
2.0E-02	X			2.0E-02	X					1	0.1		Cyclohexane, 1,2,3,4,5-pentabromo-6-chloro-	87-84-3	2.7E+01	c*	1.1E+02	c					2.8E+00	c		1.6E-02	c	
				5.0E+00	I	7.0E-01	P	V		1		5.1E+03	Cyclohexanone	108-94-1	2.8E+04	ns	1.3E+05	nms	7.3E+02	n	3.1E+03	n	1.4E+03	n		3.4E-01	n	
				5.0E-03	P	1.0E+00	X	V		1		2.8E+02	Cyclohexene	110-83-8	3.1E+02	ns	3.1E+03	ns	1.0E+03	n	4.4E+03	n	7.0E+01	n		4.6E-02	n	
				2.0E-01	I			V		1		2.9E+05	Cyclohexylamine	108-91-8	1.6E+04	n	2.3E+05	nm					3.8E+03	n		1.0E+00	n	
				2.5E-02	I					1	0.1		Cyfluthrin	68359-37-5	1.6E+03	n	2.1E+04	n					1.2E+02	n		3.1E+01	n	
				1.0E-03	O					1	0.1		Cyhalothrin	68085-85-8	6.3E+01	n	8.2E+02	n					2.0E+01	n		1.4E+01	n	
				5.0E-01	O					1	0.1		Cyromazine	66215-27-8	3.2E+04	n	4.1E+05	nm					9.9E+03	n		2.5E+00	n	
2.4E-01	I	6.9E-05	C	3.0E-05	X					1	0.1		DDD, p,p`- (DDD)	72-54-8	1.9E+00	n	9.6E+00	c**	4.1E-02	c	1.8E-01	c	3.2E-02	c**		7.5E-03	c**	
3.4E-01	I	9.7E-05	C	3.0E-04	X			V		1			DDE, p,p'-	72-55-9	2.0E+00	c*	9.3E+00	c*	2.9E-02	c	1.3E-01	c	4.6E-02	c		1.1E-02	c	
3.4E-01	I	9.7E-05	I	5.0E-04	I					1	0.03		DDT	50-29-3	1.9E+00	c*	8.5E+00	c*	2.9E-02	c	1.3E-01	c	2.3E-01	c*		7.7E-02	c*	
				3.0E-02	I					1	0.1		Dalapon	75-99-0	1.9E+03	n	2.5E+04	n					6.0E+02	n	2.0E+02	1.2E-01	n	4.1E-02
1.8E-02	C	5.1E-06	C	1.5E-01	I					1	0.1		Daminozide	1596-84-5	3.0E+01	c	1.3E+02	c	5.5E-01	c	2.4E+00	c	4.3E+00	c		9.5E-04	c	
7.0E-04	I			7.0E-03	I					1	0.1		Decabromodiphenyl ether, 2,2',3,3',4,4',5,5',6,6'- (BDE-209)	1163-19-5	4.4E+02	n	3.3E+03	c**					1.1E+02	c**		6.2E+01	c**	
				4.0E-05	I					1	0.1		Demeton	8065-48-3	2.5E+00	n	3.3E+01	n					4.2E-01	n				
1.2E-03	I			6.0E-01	I					1	0.1		Di(2-ethylhexyl)adipate	103-23-1	4.5E+02	c*	1.9E+03	c					6.5E+01	c	4.0E+02	4.7E+00	c	2.9E+01
6.1E-02	H									1	0.1		Diallate	2303-16-4	8.9E+00	c	3.8E+01	c					5.4E-01	c		8.0E-04	c	
				7.0E-04	A					1	0.1		Diazinon	333-41-5	4.4E+01	n	5.7E+02	n					1.0E+01	n		6.5E-02	n	
				1.0E-02	X			V		1			Dibenzothiophene	132-65-0	7.8E+02	n	1.2E+04	n					6.5E+01	n		1.2E+00	n	
8.0E-01	P	6.0E-03	P	2.0E-04	P	2.0E-04	I	V	M	1		9.8E+02	Dibromo-3-chloropropane, 1,2-	96-12-8	5.3E-03	c	6.4E-02	c	1.7E-04	c	2.0E-03	c	3.3E-04	c	2.0E-01	1.4E-07	c	8.6E-05
										1	0.1		Dibromoacetic acid	631-64-1											6.0E+01(G)			1.2E-02
				4.0E-04	X			V		1		1.6E+02	Dibromobenzene, 1,3-	108-36-1	3.1E+01	n	4.7E+02	ns					5.3E+00	n		5.1E-03	n	
				1.0E-02	I			V		1			Dibromobenzene, 1,4-	106-37-6	7.8E+02	n	1.2E+04	n					1.3E+02	n		1.2E-01	n	
8.4E-02	I			2.0E-02	I			V		1		8.0E+02	Dibromochloromethane	124-48-1	8.3E+00	c	3.9E+01	c					8.7E-01	c	8.0E+01(G)	2.3E-04	c	2.1E-02
2.0E+00	I	6.0E-04	I	9.0E-03	I	9.0E-03	I	V		1		1.3E+03	Dibromoethane, 1,2-	106-93-4	3.6E-02	c	1.6E-01	c	4.7E-03	c	2.0E-02	c	7.5E-03	c	5.0E-02	2.1E-06	c	1.4E-05
						4.0E-03	X	V		1		2.8E+03	Dibromomethane (Methylene Bromide)	74-95-3	2.4E+01	n	9.9E+01	n	4.2E+00	n	1.8E+01	n	8.3E+00	n		2.1E-03	n	
				3.0E-04	P					1	0.1		Dibutyltin Compounds	E1790660	1.9E+01	n	2.5E+02	n					6.0E+00	n				
				3.0E-02	I					1	0.1		Dicamba	1918-00-9	1.9E+03	n	2.5E+04	n					5.7E+02	n		1.5E-01	n	
													Dichloramine	3400-09-7											4.0E+03(G)			
		4.2E-03	P					V		1		5.5E+02	Dichloro-2-butene, 1,4-	764-41-0	2.1E-03	c	9.4E-03	c	6.7E-04	c	2.9E-03	c	1.3E-03	c		6.6E-07	c	
		4.2E-03	P					V		1		5.2E+02	Dichloro-2-butene, cis-1,4-	1476-11-5	7.4E-03	c	3.2E-02	c	6.7E-04	c	2.9E-03	c	1.3E-03	c		6.2E-07	c	
		4.2E-03	P					V		1		7.6E+02	Dichloro-2-butene, trans-1,4-	110-57-6	7.4E-03	c	3.2E-02	c	6.7E-04	c	2.9E-03	c	1.3E-03	c		6.2E-07	c	
5.0E-02	I			4.0E-03	I					1	0.1		Dichloroacetic Acid	79-43-6	1.1E+01	c*	4.6E+01	c*					1.5E+00	c*	6.0E+01(G)	3.1E-04	c*	1.2E-02
				9.0E-02	I	2.0E-01	H	V		1		3.8E+02	Dichlorobenzene, 1,2-	95-50-1	1.8E+03	ns	9.3E+03	ns	2.1E+02	n	8.8E+02	n	3.0E+02	n	6.0E+02	3.0E-01	n	5.8E-01
5.4E-03	C	1.1E-05	C	7.0E-02	A	8.0E-01	I	V		1			Dichlorobenzene, 1,4-	106-46-7	2.6E+00	c	1.1E+01	c	2.6E-01	c	1.1E+00	c	4.8E-01	c	7.5E+01	4.6E-04	c	7.2E-02
4.5E-01	I	3.4E-04	C							1	0.1		Dichlorobenzidine, 3,3'-	91-94-1	1.2E+00	c	5.1E+00	c	8.3E-03	c	3.6E-02	c	1.3E-01	c		8.2E-04	c	
				9.0E-03	X					1	0.1		Dichlorobenzophenone, 4,4'-	90-98-2	5.7E+02	n	7.4E+03	n					7.8E+01	n		4.7E-01	n	
				2.0E-01	I	1.0E-01	X	V		1		8.5E+02	Dichlorodifluoromethane	75-71-8	8.7E+01	n	3.7E+02	n	1.0E+02	n	4.4E+02	n	2.0E+02	n		3.0E-01	n	
5.7E-03	C	1.6E-06	C	2.0E-01	P			V		1		1.7E+03	Dichloroethane, 1,1-	75-34-3	3.6E+00	c	1.6E+01	c	1.8E+00	c	7.7E+00	c	2.8E+00	c		7.8E-04	c	
9.1E-02	I	2.6E-05	I	6.0E-03	X	7.0E-03	P	V		1		3.0E+03	Dichloroethane, 1,2-	107-06-2	4.6E-01	c*	2.0E+00	c*	1.1E-01	c*	4.7E-01	c*	1.7E-01	c*	5.0E+00	4.8E-05	c*	1.4E-03
				5.0E-02	I	2.0E-01	I	V		1		1.2E+03	Dichloroethylene, 1,1-	75-35-4	2.3E+02	n	1.0E+03	n	2.1E+02	n	8.8E+02	n	2.8E+02	n	7.0E+00	1.0E-01	n	2.5E-03
				2.0E-03	I			V		1		2.4E+03	Dichloroethylene, cis-1,2-	156-59-2	1.6E+02	n	2.3E+03	n					3.6E+01	n	7.0E+01	1.1E-02	n	2.1E-02
				2.0E-02	I	4.0E-02	X	V		1		1.9E+03	Dichloroethylene, trans-1,2-	156-60-5	7.0E+01	n	3.0E+02	n	4.2E+01	n	1.8E+02	n	6.8E+01	n	1.0E+02	2.1E-02	n	3.1E-02
				3.0E-03	I					1	0.1		Dichlorophenol, 2,4-	120-83-2	1.9E+02	n	2.5E+03	n					4.6E+01	n		2.3E-02	n	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; W = TEF applied; E = RPF applied; G = user's guide Section 5; M = mutagen; V = volatile; R = RBA applied ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded.

Toxicity and Chemical-specific Information												Contaminant		Screening Levels										Protection of Ground Water SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	volatile	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
				1.0E-02	I					1	0.05		Dichlorophenoxy Acetic Acid, 2,4-	94-75-7	7.0E+02	n	9.6E+03	n					1.7E+02	n	7.0E+01	4.5E-02	n	1.8E-02
3.7E-02	P	3.7E-06	P	4.0E-02	P	4.0E-03	I	V		1		1.4E+03	Dichloropropane, 1,2-	78-87-5	2.5E+00	c**	1.1E+01	c**	7.6E-01	c**	3.3E+00	c**	8.5E-01	c**	5.0E+00	2.8E-04	c**	1.7E-03
				2.0E-02	P			V		1		1.5E+03	Dichloropropane, 1,3-	142-28-9	1.6E+03	ns	2.3E+04	ns					3.7E+02	n		1.3E-01	n	
				3.0E-03	I					1	0.1		Dichloropropanol, 2,3-	616-23-9	1.9E+02	n	2.5E+03	n					5.9E+01	n		1.3E-02	n	
1.0E-01	I	4.0E-06	I	3.0E-02	I	2.0E-02	I	V		1		1.6E+03	Dichloropropene, 1,3-	542-75-6	1.8E+00	c*	8.2E+00	c*	7.0E-01	c*	3.1E+00	c*	4.7E-01	c*		1.7E-04	c*	
2.9E-01	I	8.3E-05	C	5.0E-04	I	5.0E-04	I			1	0.1		Dichlorvos	62-73-7	1.9E+00	c*	7.9E+00	c*	3.4E-02	c*	1.5E-01	c*	2.6E-01	c*		8.1E-05	c*	
				3.0E-05	O					1	0.1		Dicrotophos	141-66-2	1.9E+00	n	2.5E+01	n					6.0E-01	n		1.4E-04	n	
				8.0E-02	P	3.0E-04	X	V		1		2.6E+02	Dicyclopentadiene	77-73-6	1.3E+00	n	5.4E+00	n	3.1E-01	n	1.3E+00	n	6.3E-01	n		2.2E-03	n	
1.6E+01	I	4.6E-03	I	5.0E-05	I					1	0.1		Dieldrin	60-57-1	3.4E-02	c*	1.4E-01	c	6.1E-04	c	2.7E-03	c	1.8E-03	c		7.1E-05	c	
		3.0E-04	C			5.0E-03	I			1	0.1		Diesel Engine Exhaust	E17136615					9.4E-03	c	4.1E-02	c						
				2.0E-03	P	2.0E-04	P			1	0.1		Diethanolamine	111-42-2	1.3E+02	n	1.6E+03	n	2.1E-01	n	8.8E-01	n	4.0E+01	n		8.1E-03	n	
				3.0E-02	P	1.0E-04	P			1	0.1		Diethylene Glycol Monobutyl Ether	112-34-5	1.9E+03	n	2.4E+04	n	1.0E-01	n	4.4E-01	n	6.0E+02	n		1.3E-01	n	
				6.0E-02	P	3.0E-04	P			1	0.1		Diethylene Glycol Monoethyl Ether	111-90-0	3.8E+03	n	4.8E+04	n	3.1E-01	n	1.3E+00	n	1.2E+03	n		2.4E-01	n	
				1.0E-03	P			V		1		1.1E+05	Diethylformamide	617-84-5	7.8E+01	n	1.2E+03	n					2.0E+01	n		4.1E-03	n	
3.5E+02	C	1.0E-01	C							1	0.1		Diethylstilbestrol	56-53-1	1.6E-03	c	6.6E-03	c	2.8E-05	c	1.2E-04	c	5.1E-05	c		2.8E-05	c	
				8.3E-02	O					1	0.1		Difenzoquat	43222-48-6	5.2E+03	n	6.8E+04	n					1.7E+03	n		2.6E+02	n	
				2.0E-02	I					1	0.1		Diflubenzuron	35367-38-5	1.3E+03	n	1.6E+04	n					2.9E+02	n		3.3E-01	n	
						4.0E+01	I	V		1		1.4E+03	Difluoroethane, 1,1-	75-37-6	4.8E+04	ns	2.0E+05	nms	4.2E+04	n	1.8E+05	n	8.3E+04	n		2.8E+01	n	
						3.0E+01	X	V		1		6.9E+02	Difluoropropane, 2,2-	420-45-1	2.4E+04	ns	1.0E+05	ns	3.1E+04	n	1.3E+05	n	6.3E+04	n		1.4E+02	n	
4.4E-02	C	1.3E-05	C					V		1			Dihydrosafrole	94-58-6	9.9E+00	c	4.5E+01	c	2.2E-01	c	9.4E-01	c	3.0E-01	c		1.9E-04	c	
						7.0E-01	P	V		1		2.3E+03	Diisopropyl Ether	108-20-3	2.2E+03	n	9.4E+03	ns	7.3E+02	n	3.1E+03	n	1.5E+03	n		3.7E-01	n	
				8.0E-02	I			V		1		5.3E+02	Diisopropyl Methylphosphonate	1445-75-6	6.3E+03	ns	9.3E+04	ns					1.6E+03	n		4.5E-01	n	
				2.2E-02	O					1	0.1		Dimethipin	55290-64-7	1.4E+03	n	1.8E+04	n					4.4E+02	n		9.6E-02	n	
				2.2E-03	O					1	0.1		Dimethoate	60-51-5	1.4E+02	n	1.8E+03	n					4.4E+01	n		9.9E-03	n	
1.6E+00	P									1	0.1		Dimethoxybenzidine, 3,3'-	119-90-4	3.4E-01	c	1.4E+00	c					4.7E-02	c		5.8E-05	c	
1.7E-03	P			6.0E-02	P					1	0.1		Dimethyl methylphosphonate	756-79-6	3.2E+02	c*	1.4E+03	c*					4.6E+01	c*		9.6E-03	c*	
4.6E+00	C	1.3E-03	C							1	0.1		Dimethylamino azobenzene [p-]	60-11-7	1.2E-01	c	5.0E-01	c	2.2E-03	c	9.4E-03	c	5.0E-03	c		2.1E-05	c	
5.8E-01	H									1	0.1		Dimethylaniline HCl, 2,4-	21436-96-4	9.4E-01	c	4.0E+00	c					1.3E-01	c		1.2E-04	c	
2.0E-01	P			2.0E-03	X					1	0.1		Dimethylaniline, 2,4-	95-68-1	2.7E+00	c*	1.1E+01	c					3.7E-01	c		2.1E-04	c	
2.7E-02	P			2.0E-03	I			V		1		8.3E+02	Dimethylaniline, N,N-	121-69-7	2.6E+01	c**	1.2E+02	c*					2.5E+00	c*		9.0E-04	c*	
1.1E+01	P									1	0.1		Dimethylbenzidine, 3,3'-	119-93-7	4.9E-02	c	2.1E-01	c					6.5E-03	c		4.3E-05	c	
				1.0E-01	P	3.0E-02	I	V		1		1.1E+05	Dimethylformamide	68-12-2	2.6E+03	n	1.5E+04	n	3.1E+01	n	1.3E+02	n	6.1E+01	n		1.2E-02	n	
				1.0E-04	X	2.0E-06	X	V		1		1.7E+05	Dimethylhydrazine, 1,1-	57-14-7	5.7E-02	n	2.4E-01	n	2.1E-03	n	8.8E-03	n	4.2E-03	n		9.3E-07	n	
5.5E+02	C	1.6E-01	C					V		1		1.9E+05	Dimethylhydrazine, 1,2-	540-73-8	8.8E-04	c	4.1E-03	c	1.8E-05	c	7.7E-05	c	2.8E-05	c		6.5E-09	c	
				2.0E-02	I					1	0.1		Dimethylphenol, 2,4-	105-67-9	1.3E+03	n	1.6E+04	n					3.6E+02	n		4.2E-01	n	
				6.0E-04	I					1	0.1		Dimethylphenol, 2,6-	576-26-1	3.8E+01	n	4.9E+02	n					1.1E+01	n		1.3E-02	n	
				1.0E-03	I					1	0.1		Dimethylphenol, 3,4-	95-65-8	6.3E+01	n	8.2E+02	n					1.8E+01	n		2.1E-02	n	
4.5E-02	C	1.3E-05	C					V		1		4.7E+02	Dimethylvinylchloride	513-37-1	1.1E+00	c	4.8E+00	c	2.2E-01	c	9.4E-01	c	3.3E-01	c		1.1E-04	c	
				8.0E-05	X					1	0.1		Dinitro-o-cresol, 4,6-	534-52-1	5.1E+00	n	6.6E+01	n					1.5E+00	n		2.6E-03	n	
				2.0E-03	I					1	0.1		Dinitro-o-cyclohexyl Phenol, 4,6-	131-89-5	1.3E+02	n	1.6E+03	n					2.3E+01	n		7.7E-01	n	
				1.0E-04	P					1	0.1		Dinitrobenzene, 1,2-	528-29-0	6.3E+00	n	8.2E+01	n					1.9E+00	n		1.8E-03	n	
				1.0E-04	I					1	0.1		Dinitrobenzene, 1,3-	99-65-0	6.3E+00	n	8.2E+01	n					2.0E+00	n		1.8E-03	n	
				1.0E-04	P					1	0.1		Dinitrobenzene, 1,4-	100-25-4	6.3E+00	n	8.2E+01	n					2.0E+00	n		1.8E-03	n	
				2.0E-03	I					1	0.1		Dinitrophenol, 2,4-	51-28-5	1.3E+02	n	1.6E+03	n					3.9E+01	n		4.4E-02	n	
6.8E-01	I									1	0.1		Dinitrotoluene Mixture, 2,4/2,6-	E1615210	8.0E-01	c	3.4E+00	c					1.1E-01	c		1.5E-04	c	
3.1E-01	C	8.9E-05	C	2.0E-03	I					1	0.102		Dinitrotoluene, 2,4-	121-14-2	1.7E+00	c*	7.4E+00	c	3.2E-02	c	1.4E-01	c	2.4E-01	c		3.2E-04	c	
1.5E+00	P			3.0E-04	X					1	0.099		Dinitrotoluene, 2,6-	606-20-2	3.6E-01	c*	1.5E+00	c					4.9E-02	c		6.7E-05	c	
				1.0E-04	X					1	0.006		Dinitrotoluene, 2-Amino-4,6-	35572-78-2	7.7E+00	n	1.1E+02	n					1.9E+00	n		1.5E-03	n	
				1.0E-04	X					1	0.009		Dinitrotoluene, 4-Amino-2,6-	19406-51-0	7.7E+00	n	1.1E+02	n					1.9E+00	n		1.5E-03	n	
4.5E-01	X			9.0E-04	X					1	0.1		Dinitrotoluene, Technical grade	25321-14-6	1.2E+00	c*	5.1E+00	c					1.0E-01	c		1.4E-04	c	
				1.0E-03	I					1	0.1		Dinoseb	88-85-7	6.3E+01	n	8.2E+02	n					1.5E+01	n	7.0E+00	1.3E-01	n	6.2E-02
1.0E-01	I	5.0E-06	I	3.0E-02	I	3.0E-02	I	V		1		1.2E+05	Dioxane, 1,4-	123-91-1	5.3E+00	c	2.4E+01	c	5.6E-01	c*	2.5E+00	c*	4.6E-01	c		9.4E-05	c	
													Dioxins															
6.2E+03	I	1.3E+00	I							1	0.03		~Hexachlorodibenzo-p-dioxin, Mixture	34465-46-8	1.0E-04	c	4.7E-04	c	2.2E-06	c	9.4E-06	c	1.3E-05	c		1.7E-05	c	
1.3E+05	C	3.8E+01	C	7.0E-10	I	4.0E-08	C	V		1	0.03		~TCDD, 2,3,7,8-	1746-01-6	4.8E-06	c*	2.2E-05	c*	7.4E-08	c	3.2E-07	c	1.2E-07	c	3.0E-05	5.9E-08	c	1.5E-05
				3.0E-02	I					1	0.1		Diphenamid	957-51-7	1.9E+03	n	2.5E+04	n					5.3E+02	n		5.2E+00	n	
						4.0E-04	X	V		1			Diphenyl Ether	101-84-8	3.4E+01	n	1.4E+02	n	4.2E-01	n	1.8E+00	n	8.3E-01	n		3.4E-03	n	
				8.0E-04	X					1	0.1		Diphenyl Sulfone	127-63-9	5.1E+01	n	6.6E+02	n					1.5E+01	n		3.6E-02	n	
				1.0E-01	O					1	0.1		Diphenylamine	122-39-4	6.3E+03	n	8.2E+04	n					1.3E+03	n		2.3E+00	n	
8.0E-01	I	2.2E-04	I							1	0.1		Diphenylhydrazine, 1,2-	122-66-7	6.8E-01	c	2.9E+00	c	1.3E-02	c	5.6E-02	c	7.8E-02	c		2.5E-04	c	
				2.2E-03	I					1	0.1		Diquat	2764-72-9	1.4E+02	n	1.8E+03	n					4.0E+01	n	2.0E+01	3.3E-01	n	1.7E-01
7.4E+00	C	2.1E-03	C							1	0.1		Direct Black 38	1937-37-7	7.3E-02	c	3.1E-01	c	1.3E-03	c	5.8E-03	c	1.1E-02	c		5.1E+00	c	
7.4E+00	C	2.1E-03	C							1	0.1		Direct Blue 6	2602-46-2	7.3E-02	c	3.1E-01	c	1.3E-03	c	5.8E-03	c	1.1E-02	c		1.7E+01	c	
6.7E+00	C	1.9E-03	C							1	0.1		Direct Brown 95	16071-86-6	8.1E-02	c	3.4E-01	c	1.5E-03	c	6.5E-03	c	1.2E-02	c		1.6E-01	c	
				4.0E-05	I					1	0.1		Disulfoton	298-04-4	2.5E+00	n	3.3E+01	n					5.0E-01	n		9.4E-04	n	
				1.0E-02	I			V		1			Dithiane, 1,4-	505-29-3	7.8E+02	n	1.2E+04	n					2.0E+02	n		9.7E-02	n	
				2.0E-03	I					1	0.1		Diuron	330-54-1	1.3E+02	n	1.6E+03	n					3.6E+01	n		1.5E-02	n	
				2.0E-02	O					1	0.1		Dodine	2439-10-3	1.3E+03	n	1.6E+04	n					4.0E+02	n		2.1E+00	n	
				5.0E-02	O			V		1			EPTC	759-94-4	3.9E+03	n	5.8E+04	n					7.5E+02	n		4.0E-01	n	
				6.0E-03	I			V		1			Endosulfan	115-29-7	4.7E+02	n	7.0E+03	n					1.0E+02	n		1.4E+00	n	
				6.0E-03	P					1	0.1		Endosulfan Sulfate	1031-07-8	3.8E+02	n	4.9E+03	n					1.1E+02	n		2.1E+00	n	
				2.0E-02	I					1	0.1		Endothall	145-73-3	1.3E+03	n	1.6E+04	n					3.8E+02	n	1.0E+02	9.1E-02	n	2.4E-02
				3.0E-04	I					1	0.1		Endrin	72-20-8	1.9E+01	n	2.5E+02	n					2.3E+00	n	2.0E+00	9.2E-02	n	8.1E-02
9.9E-03	I	1.2E-06	I	6.0E-03	P	1.0E-03	I	V		1		1.1E+04	Epichlorohydrin	106-89-8	1.9E+01	n	8.2E+01	n	1.0E+00	n	4.4E+00	n	2.0E+00	n		4.5E-04	n	
						2.0E-02	I	V		1		1.5E+04	Epoxybutane, 1,2-	106-88-7	1.6E+02	n	6.7E+02	n	2.1E+01	n	8.8E+01	n	4.2E+01	n		9.2E-03	n	
				4.0E-02	P					1	0.1		Ethanol, 2-(2-methoxyethoxy)-	111-77-3	2.5E+03	n	3.3E+04	n					8.0E+02	n		1.6E-01	n	
				5.0E-03	I					1	0.1		Ethephon	16672-87-0	3.2E+02	n	4.1E+03	n					1.0E+02	n		2.1E-02	n	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; W = TEF applied; E = RPF applied; G = user's guide Section 5; M = mutagen; V = volatile; R = RBA applied ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded.

Toxicity and Chemical-specific Information												Contaminant		Screening Levels												Protection of Ground Water SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	volatile	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
				5.0E-04	I					1	0.1		Ethion	563-12-2	3.2E+01	n	4.1E+02	n					4.3E+00	n		8.5E-03	n	
				1.0E-01	P	6.0E-02	P	V		1		2.4E+04	Ethoxyethanol Acetate, 2-	111-15-9	2.6E+03	n	1.4E+04	n	6.3E+01	n	2.6E+02	n	1.2E+02	n		2.5E-02	n	
				9.0E-02	P	2.0E-01	I	V		1		1.1E+05	Ethoxyethanol, 2-	110-80-5	5.2E+03	n	4.7E+04	n	2.1E+02	n	8.8E+02	n	3.4E+02	n		6.8E-02	n	
				9.0E-01	I	7.0E-02	P	V		1		1.1E+04	Ethyl Acetate	141-78-6	6.2E+02	n	2.6E+03	n	7.3E+01	n	3.1E+02	n	1.4E+02	n		3.1E-02	n	
				5.0E-03	P	8.0E-03	P	V		1		2.5E+03	Ethyl Acrylate	140-88-5	4.7E+01	n	2.1E+02	n	8.3E+00	n	3.5E+01	n	1.4E+01	n		3.2E-03	n	
						1.0E+01	I	V		1		2.1E+03	Ethyl Chloride (Chloroethane)	75-00-3	1.4E+04	ns	5.7E+04	ns	1.0E+04	n	4.4E+04	n	2.1E+04	n		5.9E+00	n	
				2.0E-01	I			V		1		1.0E+04	Ethyl Ether	60-29-7	1.6E+04	ns	2.3E+05	nms					3.9E+03	n		8.8E-01	n	
						3.0E-01	P	V		1		1.1E+03	Ethyl Methacrylate	97-63-2	1.8E+03	ns	7.6E+03	ns	3.1E+02	n	1.3E+03	n	6.3E+02	n		1.5E-01	n	
				1.0E-05	I					1	0.1		Ethyl-p-nitrophenyl Phosphonate	2104-64-5	6.3E-01	n	8.2E+00	n					8.9E-02	n		2.8E-03	n	
1.1E-02	C	2.5E-06	C	1.0E-01	I	1.0E+00	I	V		1		4.8E+02	Ethylbenzene	100-41-4	5.8E+00	c	2.5E+01	c	1.1E+00	c	4.9E+00	c	1.5E+00	c	7.0E+02	1.7E-03	c	7.8E-01
				7.0E-02	P					1	0.1		Ethylene Cyanohydrin	109-78-4	4.4E+03	n	5.7E+04	n					1.4E+03	n		2.8E-01	n	
				9.0E-02	P			V		1		1.9E+05	Ethylene Diamine	107-15-3	7.0E+03	n	1.1E+05	nm					1.8E+03	n		4.1E-01	n	
				2.0E+00	I	4.0E-01	C			1	0.1		Ethylene Glycol	107-21-1	1.3E+05	nm	1.6E+06	nm	4.2E+02	n	1.8E+03	n	4.0E+04	n		8.1E+00	n	
				1.0E-01	I	1.6E+00	I			1	0.1		Ethylene Glycol Monobutyl Ether	111-76-2	6.3E+03	n	8.2E+04	n	1.7E+03	n	7.0E+03	n	2.0E+03	n		4.1E-01	n	
3.1E-01	C	3.0E-03	I			3.0E-02	C	V	M	1		1.2E+05	Ethylene Oxide	75-21-8	2.0E-03	c	2.5E-02	c	3.4E-04	c	4.1E-03	c	6.7E-04	c		1.4E-07	c	
4.5E-02	C	1.3E-05	C	8.0E-05	I					1	0.1		Ethylene Thiourea	96-45-7	5.1E+00	n	5.1E+01	c**	2.2E-01	c	9.4E-01	c	1.6E+00	n		3.6E-04	n	
6.5E+01	C	1.9E-02	C					V		1		1.5E+05	Ethyleneimine	151-56-4	2.7E-03	c	1.2E-02	c	1.5E-04	c	6.5E-04	c	2.4E-04	c		5.2E-08	c	
				3.0E+00	I					1	0.1		Ethylphthalyl Ethyl Glycolate	84-72-0	1.9E+05	nm	2.5E+06	nm					5.8E+04	n		1.3E+02	n	
				2.5E-04	I					1	0.1		Fenamiphos	22224-92-6	1.6E+01	n	2.1E+02	n					4.4E+00	n		4.3E-03	n	
				2.5E-02	I					1	0.1		Fenpropathrin	39515-41-8	1.6E+03	n	2.1E+04	n					6.4E+01	n		2.9E+00	n	
				2.5E-02	I					1	0.1		Fenvalerate	51630-58-1	1.6E+03	n	2.1E+04	n					5.0E+02	n		3.2E+02	n	
				1.3E-02	I					1	0.1		Fluometuron	2164-17-2	8.2E+02	n	1.1E+04	n					2.4E+02	n		1.9E-01	n	
				4.0E-02	C	1.3E-02	C			1			Fluoride	16984-48-8	3.1E+03	n	4.7E+04	n	1.4E+01	n	5.7E+01	n	8.0E+02	n	4.0E+03	1.2E+02	n	6.0E+02
				6.0E-02	I	1.3E-02	C			1			Fluorine (Soluble Fluoride)	7782-41-4	4.7E+03	n	7.0E+04	n	1.4E+01	n	5.7E+01	n	1.2E+03	n	4.0E+03	1.8E+02	n	6.0E+02
				8.0E-02	I					1	0.1		Fluridone	59756-60-4	5.1E+03	n	6.6E+04	n					1.4E+03	n		1.6E+02	n	
				4.0E-02	O					1	0.1		Flurprimidol	56425-91-3	2.5E+03	n	3.3E+04	n					6.9E+02	n		3.1E+00	n	
				2.0E-03	O					1	0.1		Flusilazole	85509-19-9	1.3E+02	n	1.6E+03	n					3.1E+01	n		5.1E+00	n	
				5.0E-01	O					1	0.1		Flutolanil	66332-96-5	3.2E+04	n	4.1E+05	nm					7.9E+03	n		4.2E+01	n	
				1.0E-02	I					1	0.1		Fluvalinate	69409-94-5	6.3E+02	n	8.2E+03	n					2.0E+02	n		2.9E+02	n	
				9.0E-02	O					1	0.1		Folpet	133-07-3	5.7E+03	n	7.4E+04	n					1.6E+03	n		3.9E-01	n	
				2.5E-03	O					1	0.1		Fomesafen	72178-02-0	1.6E+02	n	2.1E+03	n					4.8E+01	n		1.6E-01	n	
				2.0E-03	I					1	0.1		Fonofos	944-22-9	1.3E+02	n	1.6E+03	n					2.4E+01	n		4.7E-02	n	
2.1E-02	C	1.3E-05	I	2.0E-01	I	9.8E-03	A	V		1		4.2E+04	Formaldehyde	50-00-0	1.1E+01	c*	5.0E+01	c*	2.2E-01	c*	9.4E-01	c*	3.9E-01	c*		7.8E-05	c*	
				9.0E-01	P	3.0E-04	X	V		1		1.1E+05	Formic Acid	64-18-6	2.9E+01	n	1.2E+02	n	3.1E-01	n	1.3E+00	n	6.3E-01	n		1.3E-04	n	
				2.5E+00	O					1	0.1		Fosetyl-AL	39148-24-8	1.6E+05	nm	2.1E+06	nm					5.0E+04	n		6.6E+02	n	
													Furans																
				1.0E-03	X			V		1			~Dibenzofuran	132-64-9	7.8E+01	n	1.2E+03	n					7.9E+00	n		1.5E-01	n	
				1.0E-03	I			V		1		6.2E+03	~Furan	110-00-9	7.8E+01	n	1.2E+03	n					1.9E+01	n		7.3E-03	n	
				9.0E-01	I	2.0E+00	I	V		1		1.7E+05	~Tetrahydrofuran	109-99-9	1.8E+04	n	9.5E+04	n	2.1E+03	n	8.8E+03	n	3.4E+03	n		7.5E-01	n	
3.8E+00	H									1	0.1		Furazolidone	67-45-8	1.4E-01	c	6.0E-01	c					2.0E-02	c		3.9E-05	c	
				3.0E-03	I	5.0E-02	H	V		1		1.0E+04	Furfural	98-01-1	2.1E+02	n	2.6E+03	n	5.2E+01	n	2.2E+02	n	3.8E+01	n		8.1E-03	n	
1.5E+00	C	4.3E-04	C							1	0.1		Furium	531-82-8	3.6E-01	c	1.5E+00	c	6.5E-03	c	2.9E-02	c	5.1E-02	c		6.8E-05	c	
3.0E-02	I	8.6E-06	C							1	0.1		Furmecyclox	60568-05-0	1.8E+01	c	7.7E+01	c	3.3E-01	c	1.4E+00	c	1.1E+00	c		1.2E-03	c	
				6.0E-03	O					1	0.1		Glufosinate, Ammonium	77182-82-2	3.8E+02	n	4.9E+03	n					1.2E+02	n		2.6E-02	n	
				1.0E-01	A	8.0E-05	C			1	0.1		Glutaraldehyde	111-30-8	6.0E+03	n	7.0E+04	n	8.3E-02	n	3.5E-01	n	2.0E+03	n		4.0E-01	n	
				4.0E-04	I	1.0E-03	X	V		1		1.1E+05	Glycidaldehyde	765-34-4	2.3E+01	n	2.1E+02	n	1.0E+00	n	4.4E+00	n	1.7E+00	n		3.3E-04	n	
				1.0E-01	I					1	0.1		Glyphosate	1071-83-6	6.3E+03	n	8.2E+04	n					2.0E+03	n	7.0E+02	8.8E+00	n	3.1E+00
				1.0E-02	X			V		1			Guanidine	113-00-8	7.8E+02	n	1.2E+04	n					2.0E+02	n		4.5E-02	n	
				2.0E-02	P					1	0.1		Guanidine Chloride	50-01-1	1.3E+03	n	1.6E+04	n					4.0E+02	n				
				3.0E-02	X					1	0.1		Guanidine Nitrate	506-93-4	1.9E+03	n	2.5E+04	n					6.0E+02	n		1.5E-01	n	
				5.0E-05	I					1	0.1		Haloxyfop, Methyl	69806-40-2	3.2E+00	n	4.1E+01	n					7.6E-01	n		8.4E-03	n	
4.5E+00	I	1.3E-03	I	5.0E-04	I			V		1			Heptachlor	76-44-8	1.3E-01	c	6.3E-01	c	2.2E-03	c	9.4E-03	c	1.4E-03	c	4.0E-01	1.2E-04	c	3.3E-02
9.1E+00	I	2.6E-03	I	1.3E-05	I			V		1			Heptachlor Epoxide	1024-57-3	7.0E-02	c*	3.3E-01	c*	1.1E-03	c	4.7E-03	c	1.4E-03	c*	2.0E-01	2.8E-05	c*	4.1E-03
						3.0E-03	X	V		1		2.1E+02	Heptanal, n-	111-71-7	2.4E+01	n	1.0E+02	n	3.1E+00	n	1.3E+01	n	6.3E+00	n		1.4E-03	n	
				3.0E-04	X	4.0E-01	P	V		1		5.8E+01	Heptane, N-	142-82-5	2.2E+01	n	2.9E+02	ns	4.2E+02	n	1.8E+03	n	6.0E+00	n		4.8E-02	n	
				2.0E-03	I			V		1			Hexabromobenzene	87-82-1	1.6E+02	n	2.3E+03	n					4.0E+01	n		2.3E-01	n	
				2.0E-04	I					1	0.1		Hexabromodiphenyl ether, 2,2',4,4',5,5'- (BDE-153)	68631-49-2	1.3E+01	n	1.6E+02	n					4.0E+00	n				
1.6E+00	I	4.6E-04	I	8.0E-04	I			V		1			Hexachlorobenzene	118-74-1	2.1E-01	c	9.6E-01	c	6.1E-03	c	2.7E-02	c	9.8E-03	c	1.0E+00	1.2E-04	c	1.3E-02
7.8E-02	I	2.2E-05	I	1.0E-03	P			V		1		1.7E+01	Hexachlorobutadiene	87-68-3	1.2E+00	c*	5.3E+00	c	1.3E-01	c	5.6E-01	c	1.4E-01	c*		2.7E-04	c*	
6.3E+00	I	1.8E-03	I	8.0E-03	A					1	0.1		Hexachlorocyclohexane, Alpha-	319-84-6	8.6E-02	c	3.6E-01	c	1.6E-03	c	6.8E-03	c	7.2E-03	c		4.2E-05	c	
1.8E+00	I	5.3E-04	I							1	0.1		Hexachlorocyclohexane, Beta-	319-85-7	3.0E-01	c	1.3E+00	c	5.3E-03	c	2.3E-02	c	2.5E-02	c		1.5E-04	c	
1.1E+00	C	3.1E-04	C	3.0E-04	I					1	0.04		Hexachlorocyclohexane, Gamma- (Lindane)	58-89-9	5.7E-01	c*	2.5E+00	c	9.1E-03	c	4.0E-02	c	4.2E-02	c*	2.0E-01	2.4E-04	c*	1.2E-03
1.8E+00	I	5.1E-04	I							1	0.1		Hexachlorocyclohexane, Technical	608-73-1	3.0E-01	c	1.3E+00	c	5.5E-03	c	2.4E-02	c	2.5E-02	c		1.5E-04	c	
				6.0E-03	I	2.0E-04	I	V		1		1.6E+01	Hexachlorocyclopentadiene	77-47-4	1.8E+00	n	7.5E+00	n	2.1E-01	n	8.8E-01	n	4.1E-01	n	5.0E+01	1.3E-03	n	1.6E-01
4.0E-02	I	1.1E-05	C	7.0E-04	I	3.0E-02	I	V		1			Hexachloroethane	67-72-1	1.8E+00	c*	8.0E+00	c*	2.6E-01	c	1.1E+00	c	3.3E-01	c*		2.0E-04	c*	
				3.0E-04	I					1	0.1		Hexachlorophene	70-30-4	1.9E+01	n	2.5E+02	n					6.0E+00	n		8.0E+00	n	
8.0E-02	I			4.0E-03	I					1	0.015		Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	8.3E+00	c*	3.8E+01	c					9.7E-01	c*		3.7E-04	c*	
						1.0E-05	I	V		1		3.4E+03	Hexamethylene Diisocyanate, 1,6-	822-06-0	3.1E+00	n	1.3E+01	n	1.0E-02	n	4.4E-02	n	2.1E-02	n		2.1E-04	n	
						4.0E-04	C			1	0.1		Hexamethylene diisocyanate biuret	4035-89-6	5.7E+05	nm	2.4E+06	nm	4.2E-01	n	1.8E+00	n						
						4.0E-04	C			1	0.1		Hexamethylene diisocyanate isocyanurate	3779-63-3	5.7E+05	nm	2.4E+06	nm	4.2E-01	n	1.8E+00	n						
				4.0E-04	P					1	0.1		Hexamethylphosphoramide	680-31-9	2.5E+01	n	3.3E+02	n					8.0E+00	n		1.8E-03	n	
		2.0E-07	X			6.0E-01	P	V		1		1.4E+02	Hexane, Commercial	E5241997	1.2E+01	c*	5.1E+01	c*	1.4E+01	c*	6.1E+01	c*	2.8E+01	c*		2.0E-01	c*	
						7.0E-01	I	V		1		1.4E+02	Hexane, N-	110-54-3	6.1E+02	ns	2.5E+03	ns	7.3E+02	n	3.1E+03	n	1.5E+03	n		1.0E+01	n	
				2.0E+00	P					1	0.1		Hexanedioic Acid	124-04-9	1.3E+05	nm	1.6E+06	nm					4.0E+04	n		9.9E+00	n	
9.5E-03	P			7.0E-02	P	4.0E-04	P	V		1		2.7E+02	Hexanol, 1-,2-ethyl- (2-Ethyl-1-hexanol)	104-76-7	1.5E+01	n	6.3E+01	n	4.2E-01	n	1.8E+00	n	8.3E-01	n		2.3E-04	n	
				5.0E-03	I	3.0E-02	I	V		1		3.3E+03	Hexanone, 2-	591-78-6	2.0E+02	n	1.3E+03	n	3.1E+01	n	1.3E+02	n	3.8E+01	n		8.8E-03	n	
				3.3E-02	I					1	0.1		Hexazinone	51235-04-2	2.1E+03	n	2.7E+04	n					6.4E+02	n		3.0E-01	n	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; W = TEF applied; E = RPF applied; G = user's guide Section 5; M = mutagen; V = volatile; R = RBA applied ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded.

Toxicity and Chemical-specific Information												Contaminant		Screening Levels												Protection of Ground Water SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
				2.5E-02	I					1	0.1		Hexythiazox	78587-05-0	1.6E+03	n	2.1E+04	n					1.1E+02	n		5.0E-01	n	
				1.7E-02	O					1	0.1		Hydramethylnon	67485-29-4	1.1E+03	n	1.4E+04	n					3.4E+02	n		1.2E+05	n	
3.0E+00	I	4.9E-03	I			3.0E-05	P	V		1		1.1E+05	Hydrazine	302-01-2	3.2E-02	c*	1.4E-01	c*	5.7E-04	c*	2.5E-03	c*	1.1E-03	c*		2.2E-07	c*	
3.0E+00	I	4.9E-03	I							1			Hydrazine Sulfate	10034-93-2	2.3E-01	c	1.1E+00	c	5.7E-04	c	2.5E-03	c	2.6E-02	c				
						2.0E-02	I	V		1			Hydrogen Chloride	7647-01-0	2.8E+07	nm	1.2E+08	nm	2.1E+01	n	8.8E+01	n	4.2E+01	n				
				4.0E-02	C	1.4E-02	C	V		1			Hydrogen Fluoride	7664-39-3	3.1E+03	n	4.7E+04	n	1.5E+01	n	6.1E+01	n	2.8E+01	n				
						2.0E-03	I	V		1			Hydrogen Sulfide	7783-06-4	2.8E+06	nm	1.2E+07	nm	2.1E+00	n	8.8E+00	n	4.2E+00	n				
6.0E-02	P			4.0E-02	P					1	0.1		Hydroquinone	123-31-9	9.0E+00	c	3.8E+01	c					1.3E+00	c		8.7E-04	c	
6.1E-02	O			2.5E-03	O					1	0.1		Imazalil	35554-44-0	8.9E+00	c*	3.8E+01	c*					9.0E-01	c*		1.5E-02	c*	
				2.5E-01	I					1	0.1		Imazaquin	81335-37-7	1.6E+04	n	2.1E+05	nm					4.9E+03	n		2.4E+01	n	
				2.5E+00	O					1	0.1		Imazethapyr	81335-77-5	1.6E+05	nm	2.1E+06	nm					4.7E+04	n		4.1E+01	n	
				1.0E-02	A					1			Iodine	7553-56-2	7.8E+02	n	1.2E+04	n					2.0E+02	n		1.2E+01	n	
				4.0E-02	I					1	0.1		Iprodione	36734-19-7	2.5E+03	n	3.3E+04	n					7.4E+02	n		2.2E-01	n	
				7.0E-01	P					1			Iron	7439-89-6	5.5E+04	n	8.2E+05	nm					1.4E+04	n		3.5E+02	n	
				3.0E-01	I			V		1		1.0E+04	Isobutyl Alcohol	78-83-1	2.3E+04	ns	3.5E+05	nms					5.9E+03	n		1.2E+00	n	
9.5E-04	I			2.0E-01	I	2.0E+00	C			1	0.1		Isophorone	78-59-1	5.7E+02	c*	2.4E+03	c*	2.1E+03	n	8.8E+03	n	7.8E+01	c*		2.6E-02	c*	
				1.5E-02	I			V		1			Isopropalin	33820-53-0	1.2E+03	n	1.8E+04	n					4.0E+01	n		9.2E-01	n	
				2.0E+00	P	2.0E-01	P	V		1		1.1E+05	Isopropanol	67-63-0	5.6E+03	n	2.4E+04	n	2.1E+02	n	8.8E+02	n	4.1E+02	n		8.4E-02	n	
				1.0E-01	I					1	0.1		Isopropyl Methyl Phosphonic Acid	1832-54-8	6.3E+03	n	8.2E+04	n					2.0E+03	n		4.3E-01	n	
				5.0E-02	I					1	0.1		Isoxaben	82558-50-7	3.2E+03	n	4.1E+04	n					7.3E+02	n		2.0E+00	n	
						3.0E-01	A	V		1			JP-7	E1737665	4.3E+08	nm	1.8E+09	nm	3.1E+02	n	1.3E+03	n	6.3E+02	n				
				8.0E-03	O					1	0.1		Lactofen	77501-63-4	5.1E+02	n	6.6E+03	n					1.0E+02	n		4.6E+00	n	
				2.0E-04	X					1	0.1		Lactonitrile	78-97-7	1.3E+01	n	1.6E+02	n					4.0E+00	n		8.1E-04	n	
				5.0E-05	P					1			Lanthanum	7439-91-0	3.9E+00	n	5.8E+01	n					1.0E+00	n				
				2.1E-05	P					1	0.1		Lanthanum Acetate Hydrate	100587-90-4	1.3E+00	n	1.7E+01	n					4.2E-01	n				
				1.9E-05	P					1			Lanthanum Chloride Heptahydrate	10025-84-0	1.5E+00	n	2.2E+01	n					3.7E-01	n				
				2.8E-05	P					1			Lanthanum Chloride, Anhydrous	10099-58-8	2.2E+00	n	3.3E+01	n					5.7E-01	n				
				1.6E-05	P					1			Lanthanum Nitrate Hexahydrate	10277-43-7	1.3E+00	n	1.9E+01	n					3.2E-01	n				
													Lead Compounds																
8.5E-03	C	1.2E-05	C							1			~Lead Phosphate	7446-27-7	8.2E+01	c	3.8E+02	c	2.3E-01	c	1.0E+00	c	9.1E+00	c				
2.1E-01	C	8.0E-05	C							1	0.1		~Lead acetate	301-04-2	2.6E+00	c	1.1E+01	c	3.5E-02	c	1.5E-01	c	3.7E-01	c		7.5E-05	c	
										1			~Lead and Compounds	7439-92-1	4.0E+02	G	8.0E+02	G	1.5E-01	G			1.5E+01	G	1.5E+01			1.4E+01
3.8E-02	C	1.1E-05	C							1	0.1		~Lead subacetate	1335-32-6	1.4E+01	c	6.0E+01	c	2.6E-01	c	1.1E+00	c	2.1E+00	c		4.5E-04	c	
				1.0E-07	I			V		1		2.4E+00	~Tetraethyl Lead	78-00-2	7.8E-03	n	1.2E-01	n					1.3E-03	n		4.7E-06	n	
				5.0E-06	P			V		1		3.8E+02	Lewisite	541-25-3	3.9E-01	n	5.8E+00	n					9.0E-02	n		3.8E-05	n	
				7.7E-03	O					1	0.1		Linuron	330-55-2	4.9E+02	n	6.3E+03	n					1.3E+02	n		1.1E-01	n	
				2.0E-03	P					1			Lithium	7439-93-2	1.6E+02	n	2.3E+03	n					4.0E+01	n		1.2E+01	n	
				5.0E-04	I					1	0.1		MCPA	94-74-6	3.2E+01	n	4.1E+02	n					7.5E+00	n		2.0E-03	n	
				4.4E-03	O					1	0.1		MCPB	94-81-5	2.8E+02	n	3.6E+03	n					6.5E+01	n		2.6E-02	n	
				1.0E-03	I					1	0.1		MCPP	93-65-2	6.3E+01	n	8.2E+02	n					1.6E+01	n		4.7E-03	n	
				2.0E-02	I					1	0.1		Malathion	121-75-5	1.3E+03	n	1.6E+04	n					3.9E+02	n		1.0E-01	n	
				1.0E-01	I	7.0E-04	C			1	0.1		Maleic Anhydride	108-31-6	6.3E+03	n	8.0E+04	n	7.3E-01	n	3.1E+00	n	1.9E+03	n		3.8E-01	n	
				5.0E-01	I					1	0.1		Maleic Hydrazide	123-33-1	3.2E+04	n	4.1E+05	nm					1.0E+04	n		2.1E+00	n	
				1.0E-04	P					1	0.1		Malononitrile	109-77-3	6.3E+00	n	8.2E+01	n					2.0E+00	n		4.1E-04	n	
				3.0E-02	H					1	0.1		Mancozeb	8018-01-7	1.9E+03	n	2.5E+04	n					5.4E+02	n		7.6E-01	n	
				5.0E-03	I					1	0.1		Maneb	12427-38-2	3.2E+02	n	4.1E+03	n					9.8E+01	n		1.4E-01	n	
				1.4E-01	I	5.0E-05	I			1			Manganese (Diet)	7439-96-5														
				2.4E-02	G	5.0E-05	I			0.04			Manganese (Non-diet)	7439-96-5	1.8E+03	n	2.6E+04	n	5.2E-02	n	2.2E-01	n	4.3E+02	n		2.8E+01	n	
				9.0E-05	H					1	0.1		Mephosfolan	950-10-7	5.7E+00	n	7.4E+01	n					1.8E+00	n		2.6E-03	n	
				3.0E-02	I					1	0.1		Mepiquat Chloride	24307-26-4	1.9E+03	n	2.5E+04	n					6.0E+02	n		2.0E-01	n	
1.1E-02	P			4.0E-03	P					1	0.1		Mercaptobenzothiazole, 2-	149-30-4	4.9E+01	c**	2.1E+02	c*					6.3E+00	c*		1.8E-02	c*	
													Mercury Compounds																
				3.0E-04	I	3.0E-04	G			0.07			~Mercuric Chloride (and other Mercury salts)	7487-94-7	2.3E+01	n	3.5E+02	n	3.1E-01	n	1.3E+00	n	5.7E+00	n	2.0E+00			
						3.0E-04	I	V		1		3.1E+00	~Mercury (elemental)	7439-97-6	1.1E+01	ns	4.6E+01	ns	3.1E-01	n	1.3E+00	n	6.3E-01	n	2.0E+00	3.3E-02	n	1.0E-01
				1.0E-04	I					1			~Methyl Mercury	22967-92-6	7.8E+00	n	1.2E+02	n					2.0E+00	n		1.4E+01	n	
				8.0E-05	I					1	0.1		~Phenylmercuric Acetate	62-38-4	5.1E+00	n	6.6E+01	n					1.6E+00	n		5.0E-04	n	
				3.0E-05	I			V		1			Merphos	150-50-5	2.3E+00	n	3.5E+01	n					6.0E-01	n		5.9E-02	n	
				6.0E-02	I					1	0.1		Metalaxyl	57837-19-1	3.8E+03	n	4.9E+04	n					1.2E+03	n		3.3E-01	n	
				1.0E-04	I	3.0E-02	P	V		1		4.6E+03	Methacrylonitrile	126-98-7	7.5E+00	n	1.0E+02	n	3.1E+01	n	1.3E+02	n	1.9E+00	n		4.3E-04	n	
				5.0E-05	I					1	0.1		Methamidophos	10265-92-6	3.2E+00	n	4.1E+01	n					1.0E+00	n		2.1E-04	n	
				2.0E+00	I	2.0E+01	I	V		1		1.1E+05	Methanol	67-56-1	1.2E+05	nms	1.2E+06	nms	2.1E+04	n	8.8E+04	n	2.0E+04	n		4.1E+00	n	
				1.5E-03	O					1	0.1		Methidathion	950-37-8	9.5E+01	n	1.2E+03	n					2.9E+01	n		7.1E-03	n	
				2.5E-02	I					1	0.1		Methomyl	16752-77-5	1.6E+03	n	2.1E+04	n					5.0E+02	n		1.1E-01	n	
4.9E-02	C									1	0.1		Methoxy-5-nitroaniline, 2-	99-59-2	1.1E+01	c	4.7E+01	c					1.5E+00	c		5.3E-04	c	
				5.0E-03	I					1	0.1		Methoxychlor	72-43-5	3.2E+02	n	4.1E+03	n					3.7E+01	n	4.0E+01	2.0E+00	n	2.2E+00
				8.0E-03	P	1.0E-03	P	V		1		1.2E+05	Methoxyethanol Acetate, 2-	110-49-6	1.1E+02	n	5.1E+02	n	1.0E+00	n	4.4E+00	n	2.1E+00	n		4.2E-04	n	
				5.0E-03	P	2.0E-02	I	V		1		1.1E+05	Methoxyethanol, 2-	109-86-4	3.3E+02	n	3.5E+03	n	2.1E+01	n	8.8E+01	n	2.9E+01	n		5.9E-03	n	
				1.0E+00	X			V		1		2.9E+04	Methyl Acetate	79-20-9	7.8E+04	ns	1.2E+06	nms					2.0E+04	n		4.1E+00	n	
						2.0E-02	P	V		1		6.8E+03	Methyl Acrylate	96-33-3	1.5E+02	n	6.1E+02	n	2.1E+01	n	8.8E+01	n	4.2E+01	n		8.9E-03	n	
				6.0E-01	I	5.0E+00	I	V		1		2.8E+04	Methyl Ethyl Ketone (2-Butanone)	78-93-3	2.7E+04	n	1.9E+05	nms	5.2E+03	n	2.2E+04	n	5.6E+03	n		1.2E+00	n	
		1.0E-03	X	1.0E-03	P	2.0E-05	X	V		1		1.8E+05	Methyl Hydrazine	60-34-4	1.4E-01	c**	6.2E-01	c**	2.8E-03	c**	1.2E-02	c**	5.6E-03	c**		1.3E-06	c**	
						3.0E+00	I	V		1		3.4E+03	Methyl Isobutyl Ketone (4-methyl-2-pentanone)	108-10-1	3.3E+04	ns	1.4E+05	nms	3.1E+03	n	1.3E+04	n	6.3E+03	n		1.4E+00	n	
						1.0E-03	C	V		1		1.0E+04	Methyl Isocyanate	624-83-9	4.6E+00	n	1.9E+01	n	1.0E+00	n	4.4E+00	n	2.1E+00	n		5.9E-04	n	
				1.4E+00	I	7.0E-01	I	V		1		2.4E+03	Methyl Methacrylate	80-62-6	4.4E+03	ns	1.9E+04	ns	7.3E+02	n	3.1E+03	n	1.4E+03	n		3.0E-01	n	
				2.5E-04	I					1	0.1		Methyl Parathion	298-00-0	1.6E+01	n	2.1E+02	n					4.5E+00	n		7.4E-03	n	
				6.0E-02	X					1	0.1		Methyl Phosphonic Acid	993-13-5	3.8E+03	n	4.9E+04	n					1.2E+03	n		2.4E-01	n	
				6.0E-03	H	4.0E-02	H	V		1		3.9E+02	Methyl Styrene (Mixed Isomers)	25013-15-4	3.2E+02	n	2.6E+03	ns	4.2E+01	n	1.8E+02	n	2.3E+01	n		3.8E-02	n	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; W = TEF applied; E = RPF applied; G = user's guide Section 5; M = mutagen; V = volatile; R = RBA applied ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded.

Toxicity and Chemical-specific Information												Contaminant		Screening Levels												Protection of Ground Water SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	volatile	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
9.9E-02	C	2.8E-05	C							1	0.1		Methyl methanesulfonate	66-27-3	5.5E+00	c	2.3E+01	c	1.0E-01	c	4.4E-01	c	7.9E-01	c		1.6E-04	c	
1.8E-03	C	2.6E-07	C			3.0E+00	I	V		1		8.9E+03	Methyl tert-Butyl Ether (MTBE)	1634-04-4	4.7E+01	c	2.1E+02	c	1.1E+01	c	4.7E+01	c	1.4E+01	c		3.2E-03	c	
				3.0E-04	X					1	0.1		Methyl-1,4-benzenediamine dihydrochloride, 2-	615-45-2	1.9E+01	n	2.5E+02	n					6.0E+00	n		3.6E-03	n	
						3.0E+00	X	V		1		2.5E+03	Methyl-2-Pentanol, 4-	108-11-2	5.4E+04	ns	2.3E+05	nms	3.1E+03	n	1.3E+04	n	6.3E+03	n		1.4E+00	n	
9.0E-03	P			2.0E-02	X					1	0.1		Methyl-5-Nitroaniline, 2-	99-55-8	6.0E+01	c*	2.6E+02	c*					8.2E+00	c*		4.6E-03	c*	
8.3E+00	C	2.4E-03	C							1	0.1		Methyl-N-nitro-N-nitrosoguanidine, N-	70-25-7	6.5E-02	c	2.8E-01	c	1.2E-03	c	5.1E-03	c	9.4E-03	c		3.2E-06	c	
1.3E-01	C	3.7E-05	C							1	0.1		Methylaniline Hydrochloride, 2-	636-21-5	4.2E+00	c	1.8E+01	c	7.6E-02	c	3.3E-01	c	6.0E-01	c		2.6E-04	c	
				1.0E-02	A					1	0.1		Methylarsonic acid	124-58-3	6.3E+02	n	8.2E+03	n					2.0E+02	n		5.8E-02	n	
				2.0E-04	X					1	0.1		Methylbenzene,1-4-diamine monohydrochloride, 2-	74612-12-7	1.3E+01	n	1.6E+02	n					4.0E+00	n				
1.0E-01	X			3.0E-04	X					1	0.1		Methylbenzene-1,4-diamine sulfate, 2-	615-50-9	5.4E+00	c**	2.3E+01	c*					7.8E-01	c**				
2.2E+01	C	6.3E-03	C						M	1	0.1		Methylcholanthrene, 3-	56-49-5	5.5E-03	c	1.0E-01	c	1.6E-04	c	1.9E-03	c	1.1E-03	c		2.2E-03	c	
2.0E-03	I	1.0E-08	I	6.0E-03	I	6.0E-01	I	V	M	1		3.3E+03	Methylene Chloride	75-09-2	5.7E+01	c**	1.0E+03	c**	1.0E+02	c**	1.2E+03	c**	1.1E+01	c**	5.0E+00	2.9E-03	c**	1.3E-03
1.0E-01	P	4.3E-04	C	2.0E-03	P				M	1	0.1		Methylene-bis(2-chloroaniline), 4,4'-	101-14-4	1.2E+00	c	2.3E+01	c*	2.4E-03	c	2.9E-02	c	1.6E-01	c		1.8E-03	c	
4.6E-02	I	1.3E-05	C							1	0.1		Methylene-bis(N,N-dimethyl) Aniline, 4,4'-	101-61-1	1.2E+01	c	5.0E+01	c	2.2E-01	c	9.4E-01	c	7.0E-01	c		3.9E-03	c	
1.6E+00	C	4.6E-04	C			2.0E-02	C			1	0.1		Methylenebisbenzenamine, 4,4'-	101-77-9	3.4E-01	c	1.4E+00	c	6.1E-03	c	2.7E-02	c	4.7E-02	c		2.1E-04	c	
						6.0E-04	I			1	0.1		Methylenediphenyl Diisocyanate	101-68-8	8.5E+05	nm	3.6E+06	nm	6.3E-01	n	2.6E+00	n						
				7.0E-02	H			V		1		5.0E+02	Methylstyrene, Alpha-	98-83-9	5.5E+03	ns	8.2E+04	ns					7.8E+02	n		1.2E+00	n	
				1.5E-01	I					1	0.1		Metolachlor	51218-45-2	9.5E+03	n	1.2E+05	nm					2.7E+03	n		3.2E+00	n	
				2.5E-02	I					1	0.1		Metribuzin	21087-64-9	1.6E+03	n	2.1E+04	n					4.9E+02	n		1.5E-01	n	
				2.5E-01	I					1	0.1		Metsulfuron-methyl	74223-64-6	1.6E+04	n	2.1E+05	nm					4.9E+03	n		1.9E+00	n	
		4.5E-06	X	1.0E-02	X	1.0E-01	P	V		1		6.9E+00	Midrange Aliphatic Hydrocarbon Streams	E1790669	6.5E-01	c	2.8E+00	c	6.2E-01	c	2.7E+00	c	1.2E+00	c*		1.8E-02	c*	
				3.0E+00	P			V		1		3.4E-01	Mineral oils	8012-95-1	2.3E+05	nms	3.5E+06	nms					6.0E+04	n		2.4E+03	n	
1.8E+01	C	5.1E-03	C	2.0E-04	I			V		1			Mirex	2385-85-5	3.6E-02	c	1.7E-01	c	5.5E-04	c	2.4E-03	c	8.8E-04	c		6.3E-04	c	
				2.0E-03	I					1	0.1		Molinate	2212-67-1	1.3E+02	n	1.6E+03	n					3.0E+01	n		1.7E-02	n	
				5.0E-03	I	2.0E-03	A			1			Molybdenum	7439-98-7	3.9E+02	n	5.8E+03	n	2.1E+00	n	8.8E+00	n	1.0E+02	n		2.0E+00	n	
				1.0E-01	I					1			Monochloramine	10599-90-3	7.8E+03	n	1.2E+05	nm					2.0E+03	n	4.0E+03(G)			
				2.0E-03	P					1	0.1		Monomethylaniline	100-61-8	1.3E+02	n	1.6E+03	n					3.8E+01	n		1.4E-02	n	
				2.5E-02	I					1	0.1		Myclobutanil	88671-89-0	1.6E+03	n	2.1E+04	n					4.5E+02	n		5.6E+00	n	
				3.0E-04	X					1	0.1		N,N'-Diphenyl-1,4-benzenediamine	74-31-7	1.9E+01	n	2.5E+02	n					3.6E+00	n		3.7E-01	n	
				2.0E-03	I			V		1			Naled	300-76-5	1.6E+02	n	2.3E+03	n					4.0E+01	n		1.8E-02	n	
				3.0E-02	X	1.0E-01	P	V		1			Naphtha, High Flash Aromatic (HFAN)	64742-95-6	2.3E+03	n	3.5E+04	n	1.0E+02	n	4.4E+02	n	1.5E+02	n				
1.8E+00	C	0.0E+00	C							1	0.1		Naphthylamine, 2-	91-59-8	3.0E-01	c	1.3E+00	c					3.9E-02	c		2.0E-04	c	
				1.2E-01	O					1	0.1		Napropamide	15299-99-7	7.6E+03	n	9.8E+04	n					2.0E+03	n		1.3E+01	n	
9.1E-01	C	2.6E-04	C	1.1E-02	C	1.4E-05	C			1	0.1		Nickel Acetate	373-02-4	6.0E-01	c	2.5E+00	c	1.1E-02	c**	4.7E-02	c**	8.6E-02	c		1.7E-05	c	
9.1E-01	C	2.6E-04	C	1.1E-02	C	1.4E-05	C			1	0.1		Nickel Carbonate	3333-67-3	6.0E-01	c	2.5E+00	c	1.1E-02	c**	4.7E-02	c**	8.6E-02	c				
9.1E-01	C	2.6E-04	C	1.1E-02	C	1.4E-05	C	V		1			Nickel Carbonyl	13463-39-3	7.6E-01	c	3.6E+00	c	1.1E-02	c**	4.7E-02	c**	1.7E-02	c**				
9.1E-01	C	2.6E-04	C	1.1E-02	C	1.4E-05	C			0.04			Nickel Hydroxide	12054-48-7	7.6E-01	c	3.6E+00	c	1.1E-02	c**	4.7E-02	c**	7.6E-02	c				
9.1E-01	C	2.6E-04	C	1.1E-02	C	2.0E-05	C			0.04			Nickel Oxide	1313-99-1	7.6E-01	c	3.6E+00	c	1.1E-02	c**	4.7E-02	c**	7.6E-02	c				
9.1E-01	C	2.4E-04	I	1.1E-02	C	1.4E-05	C			0.04			Nickel Refinery Dust	E715532	7.6E-01	c	3.6E+00	c	1.2E-02	c**	5.1E-02	c**	8.3E-02	c		1.3E-02	c	
		2.6E-04	C	2.0E-02	I	9.0E-05	A			0.04			Nickel Soluble Salts	7440-02-0	1.5E+03	n	2.2E+04	n	1.1E-02	c**	4.7E-02	c**	3.9E+02	n		2.6E+01	n	
1.7E+00	C	4.8E-04	I	1.1E-02	C	1.4E-05	C			0.04			Nickel Subsulfide	12035-72-2	4.1E-01	c	1.9E+00	c	5.8E-03	c**	2.6E-02	c**	4.5E-02	c				
9.1E-01	C	2.6E-04	C	1.1E-02	C	1.4E-05	C			1	0.1		Nickelocene	1271-28-9	6.0E-01	c	2.5E+00	c	1.1E-02	c**	4.7E-02	c**	8.6E-02	c				
				1.6E+00	I					1			Nitrate (measured as nitrogen)	14797-55-8	1.3E+05	nm	1.9E+06	nm					3.2E+04	n	1.0E+04			
										1			Nitrate + Nitrite (measured as nitrogen)	E701177											1.0E+04			
				1.0E-01	I					1			Nitrite (measured as nitrogen)	14797-65-0	7.8E+03	n	1.2E+05	nm					2.0E+03	n	1.0E+03			
				1.0E-02	X	5.0E-05	X			1	0.1		Nitroaniline, 2-	88-74-4	6.3E+02	n	8.0E+03	n	5.2E-02	n	2.2E-01	n	1.9E+02	n		8.0E-02	n	
2.0E-02	P			4.0E-03	P	6.0E-03	P			1	0.1		Nitroaniline, 4-	100-01-6	2.7E+01	c**	1.1E+02	c*	6.3E+00	n	2.6E+01	n	3.8E+00	c*		1.6E-03	c*	
		4.0E-05	I	2.0E-03	I	9.0E-03	I	V		1		3.1E+03	Nitrobenzene	98-95-3	5.1E+00	c*	2.2E+01	c*	7.0E-02	c	3.1E-01	c	1.4E-01	c*		9.2E-05	c*	
				3.0E+03	P					1	0.1		Nitrocellulose	9004-70-0	1.9E+08	nm	2.5E+09	nm					6.0E+07	n		1.3E+04	n	
				7.0E-02	H					1	0.1		Nitrofurantoin	67-20-9	4.4E+03	n	5.7E+04	n					1.4E+03	n		6.1E-01	n	
1.3E+00	C	3.7E-04	C							1	0.1		Nitrofurazone	59-87-0	4.2E-01	c	1.8E+00	c	7.6E-03	c	3.3E-02	c	6.0E-02	c		5.4E-05	c	
1.7E-02	P			1.0E-04	P					1	0.1		Nitroglycerin	55-63-0	6.3E+00	n	8.2E+01	n					2.0E+00	n		8.5E-04	n	
				1.0E-01	I					1	0.1		Nitroguanidine	556-88-7	6.3E+03	n	8.2E+04	n					2.0E+03	n		4.8E-01	n	
		8.8E-06	P			5.0E-03	P	V		1		1.8E+04	Nitromethane	75-52-5	5.4E+00	c*	2.4E+01	c*	3.2E-01	c*	1.4E+00	c*	6.4E-01	c*		1.4E-04	c*	
		5.8E-04	X			2.0E-02	I	V		1		4.9E+03	Nitropropane, 2-	79-46-9	6.4E-02	c	2.8E-01	c	4.8E-03	c	2.1E-02	c	9.7E-03	c		2.5E-06	c	
2.7E+01	C	7.7E-03	C						M	1	0.1		Nitroso-N-ethylurea, N-	759-73-9	4.5E-03	c	8.5E-02	c	1.3E-04	c	1.6E-03	c	9.2E-04	c		2.2E-07	c	
1.2E+02	C	3.4E-02	C						M	1	0.1		Nitroso-N-methylurea, N-	684-93-5	1.0E-03	c	1.9E-02	c	3.0E-05	c	3.6E-04	c	2.1E-04	c		4.6E-08	c	
5.4E+00	I	1.6E-03	I					V		1			Nitroso-di-N-butylamine, N-	924-16-3	9.9E-02	c	4.6E-01	c	1.8E-03	c	7.7E-03	c	2.7E-03	c		5.5E-06	c	
7.0E+00	I	2.0E-03	C							1	0.1		Nitroso-di-N-propylamine, N-	621-64-7	7.8E-02	c	3.3E-01	c	1.4E-03	c	6.1E-03	c	1.1E-02	c		8.1E-06	c	
2.8E+00	I	8.0E-04	C							1	0.1		Nitrosodiethanolamine, N-	1116-54-7	1.9E-01	c	8.2E-01	c	3.5E-03	c	1.5E-02	c	2.8E-02	c		5.6E-06	c	
1.5E+02	I	4.3E-02	I						M	1	0.1		Nitrosodiethylamine, N-	55-18-5	8.1E-04	c	1.5E-02	c	2.4E-05	c	2.9E-04	c	1.7E-04	c		6.1E-08	c	
5.1E+01	I	1.4E-02	I	8.0E-06	P	4.0E-05	X	V	M	1		2.4E+05	Nitrosodimethylamine, N-	62-75-9	2.0E-03	c	3.4E-02	c	7.2E-05	c	8.8E-04	c	1.1E-04	c		2.7E-08	c	
4.9E-03	I	2.6E-06	C							1	0.1		Nitrosodiphenylamine, N-	86-30-6	1.1E+02	c	4.7E+02	c	1.1E+00	c	4.7E+00	c	1.2E+01	c		6.7E-02	c	
2.2E+01	I	6.3E-03	C					V		1		1.1E+05	Nitrosomethylethylamine, N-	10595-95-6	2.0E-02	c	9.1E-02	c	4.5E-04	c	1.9E-03	c	7.1E-04	c		2.0E-07	c	
6.7E+00	C	1.9E-03	C							1	0.1		Nitrosomorpholine [N-]	59-89-2	8.1E-02	c	3.4E-01	c	1.5E-03	c	6.5E-03	c	1.2E-02	c		2.8E-06	c	
9.4E+00	C	2.7E-03	C							1	0.1		Nitrosopiperidine [N-]	100-75-4	5.8E-02	c	2.4E-01	c	1.0E-03	c	4.5E-03	c	8.2E-03	c		4.4E-06	c	
2.1E+00	I	6.1E-04	I							1	0.1		Nitrosopyrrolidine, N-	930-55-2	2.6E-01	c	1.1E+00	c	4.6E-03	c	2.0E-02	c	3.7E-02	c		1.4E-05	c	
				1.0E-04	X					1	0.1		Nitrotoluene, m-	99-08-1	6.3E+00	n	8.2E+01	n					1.7E+00	n		1.6E-03	n	
2.2E-01	P			9.0E-04	P			V		1		1.5E+03	Nitrotoluene, o-	88-72-2	3.2E+00	c*	1.5E+01	c*					3.1E-01	c*		3.0E-04	c*	
1.6E-02	P			4.0E-03	P					1	0.1		Nitrotoluene, p-	99-99-0	3.4E+01	c**	1.4E+02	c*					4.3E+00	c*		4.0E-03	c*	
				3.0E-04	X	2.0E-02	P	V		1		6.9E+00	Nonane, n-	111-84-2	1.1E+01	ns	7.2E+01	ns	2.1E+01	n	8.8E+01	n	5.3E+00	n		7.5E-02	n	
				1.5E-02	O					1	0.1		Norflurazon	27314-13-2	9.5E+02	n	1.2E+04	n					2.9E+02	n		1.9E+00	n	
				3.0E-03	I					1	0.1		Octabromodiphenyl Ether	32536-52-0	1.9E+02	n	2.5E+03	n					6.0E+01	n		1.2E+01	n	
				5.0E-02	I					1	0.006		Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0	3.9E+03	n	5.7E+04	n					1.0E+03	n		1.3E+00	n	
				2.0E-03	H					1	0.1		Octamethylpyrophosphoramide	152-16-9	1.3E+02	n	1.6E+03	n					4.0E+01	n		9.6E-03	n	
7.8E-03	O			1.4E-01	O					1	0.1		Oryzalin	19044-88-3	7.0E+01	c	2.9E+02	c					7.9E+00	c		1.5E-02	c	
				5.0E-03	I					1	0.1		Oxadiazon	19666-30-9	3.2E+02	n	4.1E+03	n					4.7E+01	n		4.8E-01	n	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; W = TEF applied; E = RPF applied; G = user's guide Section 5; M = mutagen; V = volatile; R = RBA applied ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded.

Toxicity and Chemical-specific Information												Contaminant		Screening Levels												Protection of Ground Water SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
				2.5E-02	I					1	0.1		Oxamyl	23135-22-0	1.6E+03	n	2.1E+04	n					5.0E+02	n	2.0E+02	1.1E-01	n	4.4E-02
7.3E-02	O			3.0E-02	O					1	0.1		Oxyfluorfen	42874-03-3	7.4E+00	c	3.1E+01	c					5.4E-01	c		4.3E-02	c	
				1.3E-02	I					1	0.1		Paclobutrazol	76738-62-0	8.2E+02	n	1.1E+04	n					2.3E+02	n		4.6E-01	n	
				4.5E-03	I					1	0.1		Paraquat Dichloride	1910-42-5	2.8E+02	n	3.7E+03	n					9.0E+01	n		1.2E+00	n	
				6.0E-03	H					1	0.1		Parathion	56-38-2	3.8E+02	n	4.9E+03	n					8.6E+01	n		4.3E-01	n	
				5.0E-02	H			V		1			Pebulate	1114-71-2	3.9E+03	n	5.8E+04	n					5.6E+02	n		4.5E-01	n	
				3.0E-01	O					1	0.1		Pendimethalin	40487-42-1	1.9E+04	n	2.5E+05	nm					1.4E+03	n		1.6E+01	n	
				2.0E-03	I			V		1		3.1E-01	Pentabromodiphenyl Ether	32534-81-9	1.6E+02	ns	2.3E+03	ns					4.0E+01	n		1.7E+00	n	
				1.0E-04	I					1	0.1		Pentabromodiphenyl ether, 2,2',4,4',5- (BDE-99)	60348-60-9	6.3E+00	n	8.2E+01	n					2.0E+00	n		8.7E-02	n	
				8.0E-04	I			V		1			Pentachlorobenzene	608-93-5	6.3E+01	n	9.3E+02	n					3.2E+00	n		2.4E-02	n	
9.0E-02	P							V		1		4.6E+02	Pentachloroethane	76-01-7	7.7E+00	c	3.6E+01	c					6.5E-01	c		3.1E-04	c	
2.6E-01	H			3.0E-03	I			V		1			Pentachloronitrobenzene	82-68-8	2.7E+00	c*	1.3E+01	c					1.2E-01	c		1.5E-03	c	
4.0E-01	I	5.1E-06	C	5.0E-03	I					1	0.25		Pentachlorophenol	87-86-5	1.0E+00	c	4.0E+00	c	5.5E-01	c	2.4E+00	c	4.1E-02	c	1.0E+00	5.7E-05	c	1.4E-03
4.0E-03	X			2.0E-03	P					1	0.1		Pentaerythritol tetranitrate (PETN)	78-11-5	1.3E+02	n	5.7E+02	c**					1.9E+01	c**		2.8E-02	c**	
				1.0E-04	X					1	0.1		Pentamethylphosphoramide (PMPA)	10159-46-3	6.3E+00	n	8.2E+01	n					2.0E+00	n		4.1E-04	n	
						1.0E+00	P	V		1		3.9E+02	Pentane, n-	109-66-0	8.1E+02	ns	3.4E+03	ns	1.0E+03	n	4.4E+03	n	2.1E+03	n		1.0E+01	n	
													Perchlorates																
				7.0E-04	I					1			~Ammonium Perchlorate	7790-98-9	5.5E+01	n	8.2E+02	n					1.4E+01	n				
				7.0E-04	I					1			~Lithium Perchlorate	7791-03-9	5.5E+01	n	8.2E+02	n					1.4E+01	n				
				7.0E-04	I					1			~Perchlorate and Perchlorate Salts	14797-73-0	5.5E+01	n	8.2E+02	n					1.4E+01	n	1.5E+01(G)			
				7.0E-04	I					1			~Potassium Perchlorate	7778-74-7	5.5E+01	n	8.2E+02	n					1.4E+01	n				
				7.0E-04	I					1			~Sodium Perchlorate	7601-89-0	5.5E+01	n	8.2E+02	n					1.4E+01	n				
				2.0E-02	P					1	0.1		Perfluorobutane sulfonic acid (PFBS)	375-73-5	1.3E+03	n	1.6E+04	n					4.0E+02	n		1.3E-01	n	
				2.0E-02	P					1	0.1		Perfluorobutanesulfonate	45187-15-3	1.3E+03	n	1.6E+04	n					4.0E+02	n		1.3E-01	n	
				5.0E-02	I					1	0.1		Permethrin	52645-53-1	3.2E+03	n	4.1E+04	n					1.0E+03	n		2.4E+02	n	
2.2E-03	C	6.3E-07	C							1	0.1		Phenacetin	62-44-2	2.5E+02	c	1.0E+03	c	4.5E+00	c	1.9E+01	c	3.4E+01	c		9.7E-03	c	
				2.4E-01	O					1	0.1		Phenmedipham	13684-63-4	1.5E+04	n	2.0E+05	nm					3.8E+03	n		2.1E+01	n	
				3.0E-01	I	2.0E-01	C			1	0.1		Phenol	108-95-2	1.9E+04	n	2.5E+05	nm	2.1E+02	n	8.8E+02	n	5.8E+03	n		3.3E+00	n	
				4.0E-03	I					1	0.1		Phenol, 2-(1-methylethoxy)-, methylcarbamate	114-26-1	2.5E+02	n	3.3E+03	n					7.8E+01	n		2.5E-02	n	
				5.0E-04	X					1	0.1		Phenothiazine	92-84-2	3.2E+01	n	4.1E+02	n					4.3E+00	n		1.4E-02	n	
				2.0E-04	X			V		1		1.3E+02	Phenyl Isothiocyanate	103-72-0	1.6E+01	n	2.3E+02	ns					2.6E+00	n		1.7E-03	n	
				6.0E-03	I					1	0.1		Phenylenediamine, m-	108-45-2	3.8E+02	n	4.9E+03	n					1.2E+02	n		3.2E-02	n	
1.2E-01	P			4.0E-03	P					1	0.1		Phenylenediamine, o-	95-54-5	4.5E+00	c*	1.9E+01	c					6.5E-01	c		1.7E-04	c	
				1.0E-03	X					1	0.1		Phenylenediamine, p-	106-50-3	6.3E+01	n	8.2E+02	n					2.0E+01	n		5.4E-03	n	
1.9E-03	H									1	0.1		Phenylphenol, 2-	90-43-7	2.8E+02	c	1.2E+03	c					3.0E+01	c		4.1E-01	c	
				2.0E-04	H					1	0.1		Phorate	298-02-2	1.3E+01	n	1.6E+02	n					3.0E+00	n		3.4E-03	n	
						3.0E-04	I	V		1		1.6E+03	Phosgene	75-44-5	3.1E-01	n	1.3E+00	n	3.1E-01	n	1.3E+00	n	6.3E-01	n		1.6E-04	n	
				2.0E-02	I					1	0.1		Phosmet	732-11-6	1.3E+03	n	1.6E+04	n					3.7E+02	n		8.2E-02	n	
													Phosphates, Inorganic																
				4.9E+01	P					1			~Aluminum metaphosphate	13776-88-0	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Ammonium polyphosphate	68333-79-9	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Calcium pyrophosphate	7790-76-3	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Diammonium phosphate	7783-28-0	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Dicalcium phosphate	7757-93-9	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Dimagnesium phosphate	7782-75-4	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Dipotassium phosphate	7758-11-4	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Disodium phosphate	7558-79-4	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Monoaluminum phosphate	13530-50-2	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Monoammonium phosphate	7722-76-1	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Monocalcium phosphate	7758-23-8	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Monomagnesium phosphate	7757-86-0	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Monopotassium phosphate	7778-77-0	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Monosodium phosphate	7558-80-7	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Polyphosphoric acid	8017-16-1	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Potassium tripolyphosphate	13845-36-8	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Sodium acid pyrophosphate	7758-16-9	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Sodium aluminum phosphate (acidic)	7785-88-8	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Sodium aluminum phosphate (anhydrous)	10279-59-1	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Sodium aluminum phosphate (tetrahydrate)	10305-76-7	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Sodium hexametaphosphate	10124-56-8	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Sodium polyphosphate	68915-31-1	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Sodium trimetaphosphate	7785-84-4	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Sodium tripolyphosphate	7758-29-4	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Tetrapotassium phosphate	7320-34-5	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Tetrasodium pyrophosphate	7722-88-5	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Trialuminum sodium tetra decahydrogenoctaorthophosphate (dihydrate)	15136-87-5	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Tricalcium phosphate	7758-87-4	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Trimagnesium phosphate	7757-87-1	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Tripotassium phosphate	7778-53-2	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				4.9E+01	P					1			~Trisodium phosphate	7601-54-9	3.8E+06	nm	5.7E+07	nm					9.7E+05	n				
				3.0E-04	I	3.0E-04	I	V		1			Phosphine	7803-51-2	2.3E+01	n	3.5E+02	n	3.1E-01	n	1.3E+00	n	5.7E-01	n				
				4.9E+01	P	1.0E-02	I			1			Phosphoric Acid	7664-38-2	3.0E+06	nm	2.9E+07	nm	1.0E+01	n	4.4E+01	n	9.7E+05	n				
				2.0E-05	I			V		1			Phosphorus, White	7723-14-0	1.6E+00	n	2.3E+01	n					4.0E-01	n		1.5E-03	n	
													Phthalates																
1.4E-02	I	2.4E-06	C	2.0E-02	I					1	0.1		~Bis(2-ethylhexyl)phthalate	117-81-7	3.9E+01	c*	1.6E+02	c	1.2E+00	c	5.1E+00	c	5.6E+00	c*	6.0E+00	1.3E+00	c*	1.4E+00
1.9E-03	P			2.0E-01	I					1	0.1		~Butyl Benzyl Phthalate	85-68-7	2.9E+02	c*	1.2E+03	c					1.6E+01	c		2.4E-01	c	
				1.0E+00	I					1	0.1		~Butylphthalyl Butylglycolate	85-70-1	6.3E+04	n	8.2E+05	nm					1.3E+04	n		3.1E+02	n	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; W = TEF applied; E = RPF applied; G = user's guide Section 5; M = mutagen; V = volatile; R = RBA applied ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded.

Toxicity and Chemical-specific Information												Contaminant		Screening Levels										Protection of Ground Water SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	volatile	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
				1.0E-01	I					1	0.1		~Dibutyl Phthalate	84-74-2	6.3E+03	n	8.2E+04	n					9.0E+02	n		2.3E+00	n	
				8.0E-01	I					1	0.1		~Diethyl Phthalate	84-66-2	5.1E+04	n	6.6E+05	nm					1.5E+04	n		6.1E+00	n	
				1.0E-01	I			V		1			~Dimethylterephthalate	120-61-6	7.8E+03	n	1.2E+05	nm					1.9E+03	n		4.9E-01	n	
				1.0E-02	P					1	0.1		~Octyl Phthalate, di-N-	117-84-0	6.3E+02	n	8.2E+03	n					2.0E+02	n		5.7E+01	n	
				5.0E-01	X					1	0.1		~Phthalic Acid, p-	100-21-0	3.2E+04	n	4.1E+05	nm					9.4E+03	n		3.4E+00	n	
				2.0E+00	I	2.0E-02	C			1	0.1		~Phthalic Anhydride	85-44-9	1.3E+05	nm	1.6E+06	nm	2.1E+01	n	8.8E+01	n	3.9E+04	n		8.5E+00	n	
				7.0E-02	I					1	0.1		Picloram	1918-02-1	4.4E+03	n	5.7E+04	n					1.4E+03	n	5.0E+02	3.8E-01	n	1.4E-01
				1.0E-04	X					1	0.1		Picramic Acid (2-Amino-4,6-dinitrophenol)	96-91-3	6.3E+00	n	8.2E+01	n					2.0E+00	n		1.3E-03	n	
				2.0E-03	X					1	0.1		Picric Acid (2,4,6-Trinitrophenol)	88-89-1	1.3E+02	n	1.6E+03	n					4.0E+01	n		1.9E-01	n	
				7.0E-05	O					1	0.1		Pirimiphos, Methyl	29232-93-7	4.4E+00	n	5.7E+01	n					8.5E-01	n		8.1E-04	n	
3.0E+01	C	8.6E-03	C	7.0E-06	H					1	0.1		Polybrominated Biphenyls	36355-01-8	1.8E-02	c*	7.7E-02	c*	3.3E-04	c	1.4E-03	c	2.6E-03	c*				
													Polychlorinated Biphenyls (PCBs)															
7.0E-02	G	2.0E-05	G	7.0E-05	I			V		1	0.14		~Aroclor 1016	12674-11-2	4.1E+00	n	2.7E+01	c**	1.4E-01	c	6.1E-01	c	2.2E-01	c**		2.1E-02	c**	
2.0E+00	G	5.7E-04	G					V		1	0.14		~Aroclor 1221	11104-28-2	2.0E-01	c	8.3E-01	c	4.9E-03	c	2.1E-02	c	4.7E-03	c		8.0E-05	c	
2.0E+00	G	5.7E-04	G					V		1	0.14		~Aroclor 1232	11141-16-5	1.7E-01	c	7.2E-01	c	4.9E-03	c	2.1E-02	c	4.7E-03	c		8.0E-05	c	
2.0E+00	G	5.7E-04	G					V		1	0.14		~Aroclor 1242	53469-21-9	2.3E-01	c	9.5E-01	c	4.9E-03	c	2.1E-02	c	7.8E-03	c		1.2E-03	c	
2.0E+00	G	5.7E-04	G					V		1	0.14		~Aroclor 1248	12672-29-6	2.3E-01	c	9.4E-01	c	4.9E-03	c	2.1E-02	c	7.8E-03	c		1.2E-03	c	
2.0E+00	G	5.7E-04	G	2.0E-05	I			V		1	0.14		~Aroclor 1254	11097-69-1	2.4E-01	c**	9.7E-01	c*	4.9E-03	c	2.1E-02	c	7.8E-03	c*		2.0E-03	c*	
2.0E+00	G	5.7E-04	G					V		1	0.14		~Aroclor 1260	11096-82-5	2.4E-01	c	9.9E-01	c	4.9E-03	c	2.1E-02	c	7.8E-03	c		5.5E-03	c	
				6.0E-04	X			V		1	0.14		~Aroclor 5460	11126-42-4	3.5E+01	n	4.4E+02	n					1.2E+01	n		2.0E+00	n	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)	39635-31-9	1.3E-01	c*	5.2E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		2.8E-03	c	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)	52663-72-6	1.2E-01	c*	5.1E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		1.7E-03	c	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)	69782-90-7	1.2E-01	c*	5.0E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		1.7E-03	c	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Hexachlorobiphenyl, 2,3,3',4,4',5- (PCB 156)	38380-08-4	1.2E-01	c*	5.0E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		1.7E-03	c	
3.9E+03	W	1.1E+00	W	2.3E-08	W	1.3E-06	W	V		1	0.14		~Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)	32774-16-6	1.2E-04	c*	5.1E-04	c*	2.5E-06	c	1.1E-05	c	4.0E-06	c		1.7E-06	c	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)	65510-44-3	1.2E-01	c*	4.9E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		1.0E-03	c	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)	31508-00-6	1.2E-01	c*	4.9E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		1.0E-03	c	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)	32598-14-4	1.2E-01	c*	4.9E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		1.0E-03	c	
3.9E+00	W	1.1E-03	W	2.3E-05	W	1.3E-03	W	V		1	0.14		~Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)	74472-37-0	1.2E-01	c*	5.0E-01	c*	2.5E-03	c	1.1E-02	c	4.0E-03	c		1.0E-03	c	
1.3E+04	W	3.8E+00	W	7.0E-09	W	4.0E-07	W	V		1	0.14		~Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)	57465-28-8	3.6E-05	c*	1.5E-04	c*	7.4E-07	c	3.2E-06	c	1.2E-06	c		3.0E-07	c	
2.0E+00	I	5.7E-04	I					V		1	0.14		~Polychlorinated Biphenyls (high risk)	1336-36-3	2.3E-01	c	9.4E-01	c	4.9E-03	c	2.1E-02	c			5.0E-01			
4.0E-01	I	1.0E-04	I					V		1	0.14		~Polychlorinated Biphenyls (low risk)	1336-36-3					2.8E-02	c	1.2E-01	c	4.4E-02	c	5.0E-01	6.8E-03	c	7.8E-02
7.0E-02	I	2.0E-05	I					V		1	0.14		~Polychlorinated Biphenyls (lowest risk)	1336-36-3					1.4E-01	c	6.1E-01	c			5.0E-01			
1.3E+01	W	3.8E-03	W	7.0E-06	W	4.0E-04	W	W		1	0.14		~Tetrachlorobiphenyl, 3,3',4,4'- (PCB 77)	32598-13-3	3.8E-02	c*	1.6E-01	c*	7.4E-04	c	3.2E-03	c	6.0E-03	c*		9.4E-04	c*	
3.9E+01	W	1.1E-02	W	2.3E-06	W	1.3E-04	W	V		1	0.14		~Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)	70362-50-4	1.2E-02	c*	4.8E-02	c*	2.5E-04	c	1.1E-03	c	4.0E-04	c		6.2E-05	c	
						6.0E-04	I			1	0.1		Polymeric Methylene Diphenyl Diisocyanate (PMDI)	9016-87-9	8.5E+05	nm	3.6E+06	nm	6.3E-01	n	2.6E+00	n						
													Polynuclear Aromatic Hydrocarbons (PAHs)															
				6.0E-02	I			V		1	0.13		~Acenaphthene	83-32-9	3.6E+03	n	4.5E+04	n					5.3E+02	n		5.5E+00	n	
				3.0E-01	I			V		1	0.13		~Anthracene	120-12-7	1.8E+04	n	2.3E+05	nm					1.8E+03	n		5.8E+01	n	
1.0E-01	E	6.0E-05	E					V	M	1	0.13		~Benz[a]anthracene	56-55-3	1.1E+00	c	2.1E+01	c	1.7E-02	c	2.0E-01	c	3.0E-02	c		1.1E-02	c	
1.2E+00	C	1.1E-04	C							1	0.13		~Benzo(j)fluoranthene	205-82-3	4.2E-01	c	1.8E+00	c	2.6E-02	c	1.1E-01	c	6.5E-02	c		7.8E-02	c	
1.0E+00	I	6.0E-04	I	3.0E-04	I	2.0E-06	I		M	1	0.13		~Benzo[a]pyrene	50-32-8	1.1E-01	c	2.1E+00	c	1.7E-03	c**	8.8E-03	n	2.5E-02	c	2.0E-01	2.9E-02	c	2.4E-01
1.0E-01	E	6.0E-05	E						M	1	0.13		~Benzo[b]fluoranthene	205-99-2	1.1E+00	c	2.1E+01	c	1.7E-02	c	2.0E-01	c	2.5E-01	c		3.0E-01	c	
1.0E-02	E	6.0E-06	E						M	1	0.13		~Benzo[k]fluoranthene	207-08-9	1.1E+01	c	2.1E+02	c	1.7E-01	c	2.0E+00	c	2.5E+00	c		2.9E+00	c	
				8.0E-02	I			V		1	0.13		~Chloronaphthalene, Beta-	91-58-7	4.8E+03	n	6.0E+04	n					7.5E+02	n		3.9E+00	n	
1.0E-03	E	6.0E-07	E						M	1	0.13		~Chrysene	218-01-9	1.1E+02	c	2.1E+03	c	1.7E+00	c	2.0E+01	c	2.5E+01	c		9.0E+00	c	
1.0E+00	E	6.0E-04	E						M	1	0.13		~Dibenz[a,h]anthracene	53-70-3	1.1E-01	c	2.1E+00	c	1.7E-03	c	2.0E-02	c	2.5E-02	c		9.6E-02	c	
1.2E+01	C	1.1E-03	C							1	0.13		~Dibenzo(a,e)pyrene	192-65-4	4.2E-02	c	1.8E-01	c	2.6E-03	c	1.1E-02	c	6.5E-03	c		8.4E-02	c	
2.5E+02	C	7.1E-02	C						M	1	0.13		~Dimethylbenz(a)anthracene, 7,12-	57-97-6	4.6E-04	c	8.4E-03	c	1.4E-05	c	1.7E-04	c	1.0E-04	c		9.9E-05	c	
				4.0E-02	I					1	0.13		~Fluoranthene	206-44-0	2.4E+03	n	3.0E+04	n					8.0E+02	n		8.9E+01	n	
				4.0E-02	I			V		1	0.13		~Fluorene	86-73-7	2.4E+03	n	3.0E+04	n					2.9E+02	n		5.4E+00	n	
1.0E-01	E	6.0E-05	E						M	1	0.13		~Indeno[1,2,3-cd]pyrene	193-39-5	1.1E+00	c	2.1E+01	c	1.7E-02	c	2.0E-01	c	2.5E-01	c		9.8E-01	c	
2.9E-02	P			7.0E-02	A			V		1	0.13	3.9E+02	~Methylnaphthalene, 1-	90-12-0	1.8E+01	c	7.3E+01	c					1.1E+00	c		6.0E-03	c	
				4.0E-03	I			V		1	0.13		~Methylnaphthalene, 2-	91-57-6	2.4E+02	n	3.0E+03	n					3.6E+01	n		1.9E-01	n	
1.2E-01	C	3.4E-05	C	2.0E-02	I	3.0E-03	I	V		1	0.13		~Naphthalene	91-20-3	2.0E+00	c*	8.6E+00	c*	8.3E-02	c*	3.6E-01	c*	1.2E-01	c*		3.8E-04	c*	
1.2E+00	C	1.1E-04	C							1	0.13		~Nitropyrene, 4-	57835-92-4	4.2E-01	c	1.8E+00	c	2.6E-02	c	1.1E-01	c	1.9E-02	c		3.3E-03	c	
				3.0E-02	I			V		1	0.13		~Pyrene	129-00-0	1.8E+03	n	2.3E+04	n					1.2E+02	n		1.3E+01	n	
				2.0E-02	P					1	0.1		Potassium Perfluorobutane Sulfonate	29420-49-3	1.3E+03	n	1.6E+04	n					4.0E+02	n				
1.5E-01	I			9.0E-03	I					1	0.1		Prochloraz	67747-09-5	3.6E+00	c	1.5E+01	c					3.8E-01	c		1.9E-03	c	
				6.0E-03	H			V		1			Profluralin	26399-36-0	4.7E+02	n	7.0E+03	n					2.6E+01	n		1.6E+00	n	
				1.5E-02	I					1	0.1		Prometon	1610-18-0	9.5E+02	n	1.2E+04	n					2.5E+02	n		1.2E-01	n	
				4.0E-02	O					1	0.1		Prometryn	7287-19-6	2.5E+03	n	3.3E+04	n					6.0E+02	n		9.0E-01	n	
				7.5E-02	I					1	0.1		Pronamide	23950-58-5	4.7E+03	n	6.2E+04	n					1.2E+03	n		1.2E+00	n	
				1.3E-02	I					1	0.1		Propachlor	1918-16-7	8.2E+02	n	1.1E+04	n					2.5E+02	n		1.5E-01	n	
				5.0E-03	I					1	0.1		Propanil	709-98-8	3.2E+02	n	4.1E+03	n					8.2E+01	n		4.5E-02	n	
1.9E-01	O			4.0E-02	O					1	0.1		Propargite	2312-35-8	2.8E+00	c	1.2E+01	c					1.6E-01	c		1.1E-02	c	
				2.0E-03	I			V		1		1.1E+05	Propargyl Alcohol	107-19-7	1.6E+02	n	2.3E+03	n					4.0E+01	n		8.1E-03	n	
				2.0E-02	I					1	0.1		Propazine	139-40-2	1.3E+03	n	1.6E+04	n					3.4E+02	n		3.0E-01	n	
				2.0E-02	I					1	0.1		Propham	122-42-9	1.3E+03	n	1.6E+04	n					3.5E+02	n		2.2E-01	n	
				1.0E-01	O					1	0.1		Propiconazole	60207-90-1	6.3E+03	n	8.2E+04	n					1.6E+03	n		5.3E+00	n	
						8.0E-03	I	V		1		3.3E+04	Propionaldehyde	123-38-6	7.5E+01	n	3.1E+02	n	8.3E+00	n	3.5E+01	n	1.7E+01	n		3.4E-03	n	
				1.0E-01	X	1.0E+00	X	V		1		2.6E+02	Propyl benzene	103-65-1	3.8E+03	ns	2.4E+04	ns	1.0E+03	n	4.4E+03	n	6.6E+02	n		1.2E+00	n	
						3.0E+00	C	V		1		3.5E+02	Propylene	115-07-1	2.2E+03	ns	9.3E+03	ns	3.1E+03	n	1.3E+04	n	6.3E+03	n		6.0E+00	n	
				2.0E+01	P					1	0.1		Propylene Glycol	57-55-6	1.3E+06	nm	1.6E+07	nm					4.0E+05	n		8.1E+01	n	
						2.7E-04	A			1	0.1		Propylene Glycol Dinitrate	6423-43-4	3.9E+05	nm	1.6E+06	nm	2.8E-01	n	1.2E+00	n						
				7.0E-01	H	2.0E+00	I	V		1		1.1E+05	Propylene Glycol Monomethyl Ether	107-98-2	4.1E+04	n	3.7E+05	nms	2.1E+03	n	8.8E+03	n	3.2E+03	n		6.5E-01	n	
2.4E-01	I	3.7E-06	I			3.0E-02	I	V		1		7.8E+04	Propylene Oxide	75-56-9	2.1E+00	c	9.7E+00	c	7.6E-01	c*	3.3E+00	c*	2.7E-01	c		5.6E-05	c	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; W = TEF applied; E = RPF applied; G = user's guide Section 5; M = mutagen; V = volatile; R = RBA applied ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded.

Toxicity and Chemical-specific Information												Contaminant		Screening Levels										Protection of Ground Water SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
				1.0E-03	I			V		1		5.3E+05	Pyridine	110-86-1	7.8E+01	n	1.2E+03	n					2.0E+01	n		6.8E-03	n	
				5.0E-04	I					1	0.1		Quinalphos	13593-03-8	3.2E+01	n	4.1E+02	n					5.1E+00	n		4.3E-02	n	
3.0E+00	I									1	0.1		Quinoline	91-22-5	1.8E-01	c	7.7E-01	c					2.4E-02	c		7.8E-05	c	
				9.0E-03	I					1	0.1		Quizalofop-ethyl	76578-14-8	5.7E+02	n	7.4E+03	n					1.2E+02	n		1.9E+00	n	
						3.0E+04	A			1			Refractory Ceramic Fibers (units in fibers)	E715557					3.1E+04	G	1.3E+05	G						
				3.0E-02	I					1	0.1		Resmethrin	10453-86-8	1.9E+03	n	2.5E+04	n					6.7E+01	n		4.2E+01	n	
				5.0E-02	H			V		1			Ronnel	299-84-3	3.9E+03	n	5.8E+04	n					4.1E+02	n		3.7E+00	n	
				4.0E-03	I					1	0.1		Rotenone	83-79-4	2.5E+02	n	3.3E+03	n					6.1E+01	n		3.2E+01	n	
2.2E-01	C	6.3E-05	C						M	1	0.1		Safrole	94-59-7	5.5E-01	c	1.0E+01	c	1.6E-02	c	1.9E-01	c	9.6E-02	c		5.9E-05	c	
				5.0E-03	I					1			Selenious Acid	7783-00-8	3.9E+02	n	5.8E+03	n					1.0E+02	n				
				5.0E-03	I	2.0E-02	C			1			Selenium	7782-49-2	3.9E+02	n	5.8E+03	n	2.1E+01	n	8.8E+01	n	1.0E+02	n	5.0E+01	5.2E-01	n	2.6E-01
				5.0E-03	C	2.0E-02	C			1			Selenium Sulfide	7446-34-6	3.9E+02	n	5.8E+03	n	2.1E+01	n	8.8E+01	n	1.0E+02	n				
				1.4E-01	O					1	0.1		Sethoxydim	74051-80-2	8.8E+03	n	1.1E+05	nm					1.6E+03	n		1.4E+01	n	
						3.0E-03	C			1			Silica (crystalline, respirable)	7631-86-9	4.3E+06	nm	1.8E+07	nm	3.1E+00	n	1.3E+01	n						
				5.0E-03	I					0.04			Silver	7440-22-4	3.9E+02	n	5.8E+03	n					9.4E+01	n		8.0E-01	n	
1.2E-01	H			5.0E-03	I					1	0.1		Simazine	122-34-9	4.5E+00	c*	1.9E+01	c					6.1E-01	c	4.0E+00	3.0E-04	c	2.0E-03
				1.3E-02	I					1	0.1		Sodium Acifluorfen	62476-59-9	8.2E+02	n	1.1E+04	n					2.6E+02	n		2.1E+00	n	
				4.0E-03	I					1			Sodium Azide	26628-22-8	3.1E+02	n	4.7E+03	n					8.0E+01	n				
2.7E-01	H			3.0E-02	I					1	0.1		Sodium Diethyldithiocarbamate	148-18-5	2.0E+00	c	8.5E+00	c					2.9E-01	c		1.8E-04	c	
				5.0E-02	A	1.3E-02	C			1			Sodium Fluoride	7681-49-4	3.9E+03	n	5.8E+04	n	1.4E+01	n	5.7E+01	n	1.0E+03	n	4.0E+03	1.5E+02	n	6.0E+02
				2.0E-05	I					1	0.1		Sodium Fluoroacetate	62-74-8	1.3E+00	n	1.6E+01	n					4.0E-01	n		8.1E-05	n	
				1.0E-03	H					1			Sodium Metavanadate	13718-26-8	7.8E+01	n	1.2E+03	n					2.0E+01	n				
				8.0E-04	P					1			Sodium Tungstate	13472-45-2	6.3E+01	n	9.3E+02	n					1.6E+01	n				
				8.0E-04	P					1			Sodium Tungstate Dihydrate	10213-10-2	6.3E+01	n	9.3E+02	n					1.6E+01	n				
2.4E-02	H			3.0E-02	I					1	0.1		Stirofos (Tetrachlorovinphos)	961-11-5	2.3E+01	c*	9.6E+01	c					2.8E+00	c		8.2E-03	c	
				6.0E-01	I					1			Strontium, Stable	7440-24-6	4.7E+04	n	7.0E+05	nm					1.2E+04	n		4.2E+02	n	
				3.0E-04	I					1	0.1		Strychnine	57-24-9	1.9E+01	n	2.5E+02	n					5.9E+00	n		6.5E-02	n	
				2.0E-01	I	1.0E+00	I	V		1		8.7E+02	Styrene	100-42-5	6.0E+03	ns	3.5E+04	ns	1.0E+03	n	4.4E+03	n	1.2E+03	n	1.0E+02	1.3E+00	n	1.1E-01
				3.0E-03	P					1	0.1		Styrene-Acrylonitrile (SAN) Trimer (THNA isomer)	57964-39-3	1.9E+02	n	2.5E+03	n					4.8E+01	n				
				3.0E-03	P					1	0.1		Styrene-Acrylonitrile (SAN) Trimer (THNP isomer)	57964-40-6	1.9E+02	n	2.5E+03	n					4.8E+01	n				
				1.0E-03	P	2.0E-03	X			1	0.1		Sulfolane	126-33-0	6.3E+01	n	8.2E+02	n	2.1E+00	n	8.8E+00	n	2.0E+01	n		4.4E-03	n	
				8.0E-04	P					1	0.1		Sulfonylbis(4-chlorobenzene), 1,1'-	80-07-9	5.1E+01	n	6.6E+02	n					1.1E+01	n		6.5E-02	n	
						1.0E-03	C	V		1			Sulfur Trioxide	7446-11-9	1.4E+06	nm	6.0E+06	nm	1.0E+00	n	4.4E+00	n	2.1E+00	n				
						1.0E-03	C			1			Sulfuric Acid	7664-93-9	1.4E+06	nm	6.0E+06	nm	1.0E+00	n	4.4E+00	n						
2.5E-02	I	7.1E-06	I	5.0E-02	H					1	0.1		Sulfurous acid, 2-chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester	140-57-8	2.2E+01	c	9.2E+01	c	4.0E-01	c	1.7E+00	c	1.3E+00	c		1.5E-02	c	
				3.0E-02	H					1	0.1		TCMTB	21564-17-0	1.9E+03	n	2.5E+04	n					4.8E+02	n		3.3E+00	n	
				7.0E-02	I					1	0.1		Tebuthiuron	34014-18-1	4.4E+03	n	5.7E+04	n					1.4E+03	n		3.9E-01	n	
				2.0E-02	H					1	0.1		Temephos	3383-96-8	1.3E+03	n	1.6E+04	n					4.0E+02	n		7.6E+01	n	
				1.3E-02	I					1	0.1		Terbacil	5902-51-2	8.2E+02	n	1.1E+04	n					2.5E+02	n		7.5E-02	n	
				2.5E-05	H			V		1		3.1E+01	Terbufos	13071-79-9	2.0E+00	n	2.9E+01	n					2.4E-01	n		5.2E-04	n	
				1.0E-03	I					1	0.1		Terbutryn	886-50-0	6.3E+01	n	8.2E+02	n					1.3E+01	n		1.9E-02	n	
5.0E-03	C	1.3E-06	C					V		1			Tert-Butyl Acetate	540-88-5	8.1E+00	c	3.6E+01	c	2.2E+00	c	9.4E+00	c	3.3E+00	c		7.6E-04	c	
				1.0E-04	I					1	0.1		Tetrabromodiphenyl ether, 2,2',4,4'- (BDE-47)	5436-43-1	6.3E+00	n	8.2E+01	n					2.0E+00	n		5.3E-02	n	
				3.0E-04	I			V		1			Tetrachlorobenzene, 1,2,4,5-	95-94-3	2.3E+01	n	3.5E+02	n					1.7E+00	n		7.9E-03	n	
2.6E-02	I	7.4E-06	I	3.0E-02	I			V		1		6.8E+02	Tetrachloroethane, 1,1,1,2-	630-20-6	2.0E+00	c	8.8E+00	c	3.8E-01	c	1.7E+00	c	5.7E-01	c		2.2E-04	c	
2.0E-01	I	5.8E-05	C	2.0E-02	I			V		1		1.9E+03	Tetrachloroethane, 1,1,2,2-	79-34-5	6.0E-01	c	2.7E+00	c	4.8E-02	c	2.1E-01	c	7.6E-02	c		3.0E-05	c	
2.1E-03	I	2.6E-07	I	6.0E-03	I	4.0E-02	I	V		1		1.7E+02	Tetrachloroethylene	127-18-4	2.4E+01	c**	1.0E+02	c**	1.1E+01	c**	4.7E+01	c**	1.1E+01	c**	5.0E+00	5.1E-03	c**	2.3E-03
				3.0E-02	I					1	0.1		Tetrachlorophenol, 2,3,4,6-	58-90-2	1.9E+03	n	2.5E+04	n					2.4E+02	n		1.8E-01	n	
1.6E+01	X			6.0E-05	X			V		1			Tetrachlorotoluene, p- alpha, alpha, alpha-	5216-25-1	4.3E-02	c	2.0E-01	c					1.7E-03	c		5.7E-06	c	
				5.0E-04	I					1	0.1		Tetraethyl Dithiopyrophosphate	3689-24-5	3.2E+01	n	4.1E+02	n					7.1E+00	n		5.2E-03	n	
						8.0E+01	I	V		1		2.1E+03	Tetrafluoroethane, 1,1,1,2-	811-97-2	1.0E+05	nms	4.3E+05	nms	8.3E+04	n	3.5E+05	n	1.7E+05	n		9.3E+01	n	
				1.0E-04	X					1	0.1		Tetramethylphosphoramide, -N,N,N',N" (TMPA)	16853-36-4	6.3E+00	n	8.2E+01	n					2.0E+00	n				
				2.0E-03	P					1	0.00065		Tetryl (Trinitrophenylmethylnitramine)	479-45-8	1.6E+02	n	2.3E+03	n					3.9E+01	n		3.7E-01	n	
				2.0E-05	G					1			Thallic Oxide	1314-32-5	1.6E+00	n	2.3E+01	n					4.0E-01	n				
				1.0E-05	X					1			Thallium (I) Nitrate	10102-45-1	7.8E-01	n	1.2E+01	n					2.0E-01	n				
				1.0E-05	X					1			Thallium (Soluble Salts)	7440-28-0	7.8E-01	n	1.2E+01	n					2.0E-01	n	2.0E+00	1.4E-02	n	1.4E-01
				1.0E-05	X			V		1			Thallium Acetate	563-68-8	7.8E-01	n	1.2E+01	n					2.0E-01	n		4.1E-05	n	
				2.0E-05	X			V		1			Thallium Carbonate	6533-73-9	1.6E+00	n	2.3E+01	n					4.0E-01	n		8.3E-05	n	
				1.0E-05	X					1			Thallium Chloride	7791-12-0	7.8E-01	n	1.2E+01	n					2.0E-01	n				
				1.0E-05	G					1			Thallium Selenite	12039-52-0	7.8E-01	n	1.2E+01	n					2.0E-01	n				
				2.0E-05	X					1			Thallium Sulfate	7446-18-6	1.6E+00	n	2.3E+01	n					4.0E-01	n				
				4.3E-02	O					1	0.1		Thifensulfuron-methyl	79277-27-3	2.7E+03	n	3.5E+04	n					8.6E+02	n		2.6E-01	n	
				1.0E-02	I					1	0.1		Thiobencarb	28249-77-6	6.3E+02	n	8.2E+03	n					1.6E+02	n		5.5E-01	n	
				7.0E-02	X					1	0.0075		Thiodiglycol	111-48-8	5.4E+03	n	7.9E+04	n					1.4E+03	n		2.8E-01	n	
				3.0E-04	H					1	0.1		Thiofanox	39196-18-4	1.9E+01	n	2.5E+02	n					5.3E+00	n		1.8E-03	n	
1.2E-02	O			2.7E-02	O					1	0.1		Thiophanate, Methyl	23564-05-8	4.7E+01	c*	2.0E+02	c					6.7E+00	c*		5.7E-03	c*	
				1.5E-02	O					1	0.1		Thiram	137-26-8	9.5E+02	n	1.2E+04	n					2.9E+02	n		4.2E-01	n	
				6.0E-01	H					1			Tin	7440-31-5	4.7E+04	n	7.0E+05	nm					1.2E+04	n		3.0E+03	n	
						1.0E-04	A	V		1			Titanium Tetrachloride	7550-45-0	1.4E+05	nm	6.0E+05	nm	1.0E-01	n	4.4E-01	n	2.1E-01	n				
				8.0E-02	I	5.0E+00	I	V		1		8.2E+02	Toluene	108-88-3	4.9E+03	ns	4.7E+04	ns	5.2E+03	n	2.2E+04	n	1.1E+03	n	1.0E+03	7.6E-01	n	6.9E-01
3.9E-02	C	1.1E-05	C			8.0E-06	C	V		1			Toluene-2,4-diisocyanate	584-84-9	6.4E+00	n	2.7E+01	n	8.3E-03	n	3.5E-02	n	1.7E-02	n		2.5E-04	n	
1.8E-01	X			2.0E-04	X					1	0.1		Toluene-2,5-diamine	95-70-5	3.0E+00	c**	1.3E+01	c*					4.3E-01	c**		1.3E-04	c**	
3.9E-02	C	1.1E-05	C			8.0E-06	C	V		1		1.7E+03	Toluene-2,6-diisocyanate	91-08-7	5.3E+00	n	2.2E+01	n	8.3E-03	n	3.5E-02	n	1.7E-02	n		2.6E-04	n	
				5.0E-03	P					1	0.1		Toluic Acid, p-	99-94-5	3.2E+02	n	4.1E+03	n					9.0E+01	n		2.3E-02	n	
1.6E-02	P	5.1E-05	C							1	0.1		Toluidine, o- (Methylaniline, 2-)	95-53-4	3.4E+01	c	1.4E+02	c	5.5E-02	c	2.4E-01	c	4.7E+00	c		2.0E-03	c	
3.0E-02	P			4.0E-03	X					1	0.1		Toluidine, p-	106-49-0	1.8E+01	c*	7.7E+01	c*					2.5E+00	c*		1.1E-03	c*	
				3.0E+00	P			V		1		3.4E-01	Total Petroleum Hydrocarbons (Aliphatic High)	E1790670	2.3E+05	nms	3.5E+06	nms					6.0E+04	n		2.4E+03	n	

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; W = TEF applied; E = RPF applied; G = user's guide Section 5; M = mutagen; V = volatile; R = RBA applied ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = ceiling limit exceeded; s = Csat exceeded.

Toxicity and Chemical-specific Information												Contaminant		Screening Levels										Protection of Ground Water SSLs		
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	volatile	mutagen	GIABS	ABS_d	C_{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m^3)	key	Industrial Air (ug/m^3)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)
						6.0E-01	P	V		1		1.4E+02	Total Petroleum Hydrocarbons (Aliphatic Low)	E1790666	5.2E+02	ns	2.2E+03	ns	6.3E+02	n	2.6E+03	n	1.3E+03	n		8.8E+00	n	
				1.0E-02	X	1.0E-01	P	V		1		6.9E+00	Total Petroleum Hydrocarbons (Aliphatic Medium)	E1790668	9.6E+01	ns	4.4E+02	ns	1.0E+02	n	4.4E+02	n	1.0E+02	n		1.5E+00	n	
				4.0E-02	P					1	0.13		Total Petroleum Hydrocarbons (Aromatic High)	E1790676	2.4E+03	n	3.0E+04	n					8.0E+02	n		8.9E+01	n	
				4.0E-03	P	3.0E-02	P	V		1		1.8E+03	Total Petroleum Hydrocarbons (Aromatic Low)	E1790672	8.2E+01	n	4.2E+02	n	3.1E+01	n	1.3E+02	n	3.3E+01	n		1.7E-02	n	
				4.0E-03	P	3.0E-03	P	V		1	0.13		Total Petroleum Hydrocarbons (Aromatic Medium)	E1790674	9.7E+01	n	5.6E+02	n	3.1E+00	n	1.3E+01	n	5.5E+00	n		2.3E-02	n	
1.1E+00	I	3.2E-04	I	9.0E-05	P					1	0.1		Toxaphene	8001-35-2	4.9E-01	c*	2.1E+00	c*	8.8E-03	c	3.8E-02	c	7.1E-02	c*	3.0E+00	1.1E-02	c*	4.6E-01
				3.0E-05	X					1	0.1		Toxaphene, Weathered	E1841606	1.9E+00	n	2.5E+01	n					6.0E-01	n		9.3E-02	n	
				7.5E-03	I					1	0.1		Tralomethrin	66841-25-6	4.7E+02	n	6.2E+03	n					1.5E+02	n		5.8E+01	n	
				3.0E-04	A			V		1			Tri-n-butyltin	688-73-3	2.3E+01	n	3.5E+02	n					3.7E+00	n		8.2E-02	n	
				8.0E+01	X					1	0.1		Triacetin	102-76-1	5.1E+06	nm	6.6E+07	nm					1.6E+06	n		4.5E+02	n	
				3.4E-02	O					1	0.1		Triadimefon	43121-43-3	2.1E+03	n	2.8E+04	n					6.3E+02	n		5.0E-01	n	
7.2E-02	O			2.5E-02	O			V		1			Triallate	2303-17-5	9.7E+00	c	4.6E+01	c					4.7E-01	c		1.0E-03	c	
				1.0E-02	I					1	0.1		Triasulfuron	82097-50-5	6.3E+02	n	8.2E+03	n					2.0E+02	n		2.1E-01	n	
				8.0E-03	I					1	0.1		Tribenuron-methyl	101200-48-0	5.1E+02	n	6.6E+03	n					1.6E+02	n		6.1E-02	n	
				5.0E-03	I			V		1			Tribromobenzene, 1,2,4-	615-54-3	3.9E+02	n	5.8E+03	n					4.5E+01	n		6.4E-02	n	
				9.0E-03	X					1	0.1		Tribromophenol, 2,4,6-	118-79-6	5.7E+02	n	7.4E+03	n					1.2E+02	n		2.2E-01	n	
				1.0E-04	O					1	0.1		Tribufos	78-48-8	6.3E+00	n	8.2E+01	n					2.8E-01	n		1.4E-03	n	
9.0E-03	P			1.0E-02	P					1	0.1		Tributyl Phosphate	126-73-8	6.0E+01	c*	2.6E+02	c*					5.2E+00	c*		2.5E-02	c*	
				3.0E-04	P					1	0.1		Tributyltin Compounds	E1790678	1.9E+01	n	2.5E+02	n					6.0E+00	n				
				3.0E-04	I					1	0.1		Tributyltin Oxide	56-35-9	1.9E+01	n	2.5E+02	n					5.7E+00	n		2.9E+02	n	
													Trichloramine	10025-85-1											4.0E+03(G)			
				3.0E+01	I	5.0E+00	P	V		1		9.1E+02	Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	6.7E+03	ns	2.8E+04	ns	5.2E+03	n	2.2E+04	n	1.0E+04	n		2.6E+01	n	
7.0E-02	I			2.0E-02	I					1	0.1		Trichloroacetic Acid	76-03-9	7.8E+00	c	3.3E+01	c					1.1E+00	c	6.0E+01(G)	2.2E-04	c	1.2E-02
2.9E-02	H									1	0.1		Trichloroaniline HCl, 2,4,6-	33663-50-2	1.9E+01	c	7.9E+01	c					2.7E+00	c		7.4E-03	c	
7.0E-03	X			3.0E-05	X					1	0.1		Trichloroaniline, 2,4,6-	634-93-5	1.9E+00	n	2.5E+01	n					4.0E-01	n		3.6E-03	n	
				8.0E-04	X			V		1			Trichlorobenzene, 1,2,3-	87-61-6	6.3E+01	n	9.3E+02	n					7.0E+00	n		2.1E-02	n	
2.9E-02	P			1.0E-02	I	2.0E-03	P	V		1		4.0E+02	Trichlorobenzene, 1,2,4-	120-82-1	2.4E+01	c**	1.1E+02	c**	2.1E+00	n	8.8E+00	n	1.2E+00	c**	7.0E+01	3.4E-03	c**	2.0E-01
				2.0E+00	I	5.0E+00	I	V		1		6.4E+02	Trichloroethane, 1,1,1-	71-55-6	8.1E+03	ns	3.6E+04	ns	5.2E+03	n	2.2E+04	n	8.0E+03	n	2.0E+02	2.8E+00	n	7.0E-02
5.7E-02	I	1.6E-05	I	4.0E-03	I	2.0E-04	X	V		1		2.2E+03	Trichloroethane, 1,1,2-	79-00-5	1.1E+00	c**	5.0E+00	c**	1.8E-01	c**	7.7E-01	c**	2.8E-01	c**	5.0E+00	8.9E-05	c**	1.6E-03
4.6E-02	I	4.1E-06	I	5.0E-04	I	2.0E-03	I	V	M	1		6.9E+02	Trichloroethylene	79-01-6	9.4E-01	c**	6.0E+00	c**	4.8E-01	c**	3.0E+00	c**	4.9E-01	c**	5.0E+00	1.8E-04	c**	1.8E-03
				3.0E-01	I			V		1		1.2E+03	Trichlorofluoromethane	75-69-4	2.3E+04	ns	3.5E+05	nms					5.2E+03	n		3.3E+00	n	
				1.0E-01	I					1	0.1		Trichlorophenol, 2,4,5-	95-95-4	6.3E+03	n	8.2E+04	n					1.2E+03	n		4.0E+00	n	
1.1E-02	I	3.1E-06	I	1.0E-03	P					1	0.1		Trichlorophenol, 2,4,6-	88-06-2	4.9E+01	c**	2.1E+02	c**	9.1E-01	c	4.0E+00	c	4.1E+00	c**		4.0E-03	c**	
				1.0E-02	I					1	0.1		Trichlorophenoxyacetic Acid, 2,4,5-	93-76-5	6.3E+02	n	8.2E+03	n					1.6E+02	n		6.8E-02	n	
				8.0E-03	I					1	0.1		Trichlorophenoxypropionic acid, -2,4,5	93-72-1	5.1E+02	n	6.6E+03	n					1.1E+02	n	5.0E+01	6.1E-02	n	2.8E-02
				5.0E-03	I			V		1		1.3E+03	Trichloropropane, 1,1,2-	598-77-6	3.9E+02	n	5.8E+03	ns					8.8E+01	n		3.5E-02	n	
3.0E+01	I			4.0E-03	I	3.0E-04	I	V	M	1		1.4E+03	Trichloropropane, 1,2,3-	96-18-4	5.1E-03	c	1.1E-01	c	3.1E-01	n	1.3E+00	n	7.5E-04	c		3.2E-07	c	
				3.0E-03	X	3.0E-04	P	V		1		3.1E+02	Trichloropropene, 1,2,3-	96-19-5	7.3E-01	n	3.1E+00	n	3.1E-01	n	1.3E+00	n	6.2E-01	n		3.1E-04	n	
				2.0E-02	A					1	0.1		Tricresyl Phosphate (TCP)	1330-78-5	1.3E+03	n	1.6E+04	n					1.6E+02	n		1.5E+01	n	
				3.0E-03	I					1	0.1		Tridiphane	58138-08-2	1.9E+02	n	2.5E+03	n					1.8E+01	n		1.3E-01	n	
						7.0E-03	I	V		1		2.8E+04	Triethylamine	121-44-8	1.2E+02	n	4.8E+02	n	7.3E+00	n	3.1E+01	n	1.5E+01	n		4.4E-03	n	
				2.0E+00	P					1	0.1		Triethylene Glycol	112-27-6	1.3E+05	nm	1.6E+06	nm					4.0E+04	n		8.8E+00	n	
						2.0E+01	P	V		1		4.8E+03	Trifluoroethane, 1,1,1-	420-46-2	1.5E+04	ns	6.2E+04	ns	2.1E+04	n	8.8E+04	n	4.2E+04	n		1.3E+02	n	
7.7E-03	I			7.5E-03	I			V		1			Trifluralin	1582-09-8	9.0E+01	c**	4.2E+02	c*					2.6E+00	c*		8.4E-02	c*	
2.0E-02	P			1.0E-02	P					1	0.1		Trimethyl Phosphate	512-56-1	2.7E+01	c*	1.1E+02	c*					3.9E+00	c*		8.6E-04	c*	
				1.0E-02	I	6.0E-02	I	V		1		2.9E+02	Trimethylbenzene, 1,2,3-	526-73-8	3.4E+02	ns	2.0E+03	ns	6.3E+01	n	2.6E+02	n	5.5E+01	n		8.1E-02	n	
				1.0E-02	I	6.0E-02	I	V		1		2.2E+02	Trimethylbenzene, 1,2,4-	95-63-6	3.0E+02	ns	1.8E+03	ns	6.3E+01	n	2.6E+02	n	5.6E+01	n		8.1E-02	n	
				1.0E-02	I	6.0E-02	I	V		1		1.8E+02	Trimethylbenzene, 1,3,5-	108-67-8	2.7E+02	ns	1.5E+03	ns	6.3E+01	n	2.6E+02	n	6.0E+01	n		8.7E-02	n	
				1.0E-02	X			V		1		3.0E+01	Trimethylpentene, 2,4,4-	25167-70-8	7.8E+02	ns	1.2E+04	ns					3.8E+01	n		1.3E-01	n	
				3.0E-02	I					1	0.019		Trinitrobenzene, 1,3,5-	99-35-4	2.2E+03	n	3.2E+04	n					5.9E+02	n		2.1E+00	n	
3.0E-02	I			5.0E-04	I					1	0.032		Trinitrotoluene, 2,4,6-	118-96-7	2.1E+01	c**	9.6E+01	c**					2.5E+00	c**		1.5E-02	c**	
				2.0E-02	P					1	0.1		Triphenylphosphine Oxide	791-28-6	1.3E+03	n	1.6E+04	n					3.6E+02	n		1.5E+00	n	
				2.0E-02	A					1	0.1		Tris(1,3-Dichloro-2-propyl) Phosphate	13674-87-8	1.3E+03	n	1.6E+04	n					3.6E+02	n		8.0E+00	n	
				1.0E-02	X					1	0.1		Tris(1-chloro-2-propyl)phosphate	13674-84-5	6.3E+02	n	8.2E+03	n					1.9E+02	n		6.5E-01	n	
2.3E+00	C	6.6E-04	C					V		1		4.7E+02	Tris(2,3-dibromopropyl)phosphate	126-72-7	2.8E-01	c	1.3E+00	c	4.3E-03	c	1.9E-02	c	6.8E-03	c		1.3E-04	c	
2.0E-02	P			7.0E-03	P					1	0.1		Tris(2-chloroethyl)phosphate	115-96-8	2.7E+01	c*	1.1E+02	c*					3.8E+00	c*		3.8E-03	c*	
3.2E-03	P			1.0E-01	P					1	0.1		Tris(2-ethylhexyl)phosphate	78-42-2	1.7E+02	c*	7.2E+02	c					2.4E+01	c*		1.2E+02	c*	
				8.0E-04	P					1			Tungsten	7440-33-7	6.3E+01	n	9.3E+02	n					1.6E+01	n		2.4E+00	n	
				2.0E-04	A	4.0E-05	A			1			Uranium	7440-61-1	1.6E+01	n	2.3E+02	n	4.2E-02	n	1.8E-01	n	4.0E+00	n	3.0E+01	1.8E+00	n	1.4E+01
1.0E+00	C	2.9E-04	C						M	1	0.1		Urethane	51-79-6	1.2E-01	c	2.3E+00	c	3.5E-03	c	4.2E-02	c	2.5E-02	c		5.6E-06	c	
		8.3E-03	P	9.0E-03	I	7.0E-06	P			0.026			Vanadium Pentoxide	1314-62-1	4.6E+02	c**	2.0E+03	c**	3.4E-04	c*	1.5E-03	c*	1.5E+02	n				
				5.0E-03	G	1.0E-04	A			0.026			Vanadium and Compounds	7440-62-2	3.9E+02	n	5.8E+03	n	1.0E-01	n	4.4E-01	n	8.6E+01	n		8.6E+01	n	
				1.0E-03	I			V		1			Vernolate	1929-77-7	7.8E+01	n	1.2E+03	n					1.1E+01	n		8.9E-03	n	
				1.2E-03	O					1	0.1		Vinclozolin	50471-44-8	7.6E+01	n	9.8E+02	n					2.1E+01	n		1.6E-02	n	
				1.0E+00	H	2.0E-01	I	V		1		2.8E+03	Vinyl Acetate	108-05-4	9.1E+02	n	3.8E+03	ns	2.1E+02	n	8.8E+02	n	4.1E+02	n		8.7E-02	n	
		1.5E-05	P			3.0E-03	I	V		1		2.5E+03	Vinyl Bromide	593-60-2	2.6E-01	c*	1.1E+00	c*	1.9E-01	c*	8.2E-01	c*	3.7E-01	c*		1.1E-04	c*	
7.2E-01	I	4.4E-06	I	3.0E-03	I	1.0E-01	I	V	M	1		3.9E+03	Vinyl Chloride	75-01-4	5.9E-02	c	1.7E+00	c	1.7E-01	c	2.8E+00	c	1.9E-02	c	2.0E+00	6.5E-06	c	6.9E-04
				3.0E-04	I					1	0.1		Warfarin	81-81-2	1.9E+01	n	2.5E+02	n					5.6E+00	n		5.9E-03	n	
				2.0E-01	G	1.0E-01	G	V		1		3.9E+02	Xylene, m-	108-38-3	5.5E+02	ns	2.4E+03	ns	1.0E+02	n	4.4E+02	n	1.9E+02	n		1.9E-01	n	
				2.0E-01	G	1.0E-01	G	V		1		4.3E+02	Xylene, o-	95-47-6	6.5E+02	ns	2.8E+03	ns	1.0E+02	n	4.4E+02	n	1.9E+02	n		1.9E-01	n	
				2.0E-01	G	1.0E-01	G	V		1		3.9E+02	Xylene, p-	106-42-3	5.6E+02	ns	2.4E+03	ns	1.0E+02	n	4.4E+02	n	1.9E+02	n		1.9E-01	n	
				2.0E-01	I	1.0E-01	I	V		1		2.6E+02	Xylenes	1330-20-7	5.8E+02	ns	2.5E+03	ns	1.0E+02	n	4.4E+02	n	1.9E+02	n	1.0E+04	1.9E-01	n	9.9E+00
				3.0E-04	I					1			Zinc Phosphide	1314-84-7	2.3E+01	n	3.5E+02	n					6.0E+00	n				
				3.0E-01	I					1			Zinc and Compounds	7440-66-6	2.3E+04	n	3.5E+05	nm					6.0E+03	n		3.7E+02	n	
				5.0E-02	I					1	0.1		Zineb	12122-67-7	3.2E+03	n	4.1E+04	n					9.9E+02	n		2.9E+00	n	
				8.0E-05	X					1			Zirconium	7440-67-7	6.3E+00	n	9.3E+01	n					1.6E+00	n		4.8E+00	n	

NSW EPA

Waste Classification Guidelines
Part 1: Classifying waste

November 2014

Table 1: CT1 & CT2 values for classifying waste by chemical assessment without the TCLP test

For disposal requirements for organic and inorganic chemical contaminants not listed below, contact the EPA. Aluminium, barium, boron, chromium (0 and III oxidation states), cobalt, copper, iron, manganese, vanadium and zinc have not been listed with values in this table and need not be tested for.

	Maximum values of *specific contaminant concentration* (SCC) for classification without TCLP		
	General solid waste[1]	**Restricted solid waste**	
Contaminant	**CT1 (mg/kg)**	**CT2 (mg/kg)**	**CAS Registry Number**
Arsenic	100	400	
Benzene	10	40	71-43-2
Benzo(a)pyrene[2]	0.8	3.2	50-32-8
Beryllium	20	80	
Cadmium	20	80	
Carbon tetrachloride	10	40	56-23-5
Chlorobenzene	2,000	8,000	108-90-7
Chloroform	120	480	67-66-3
Chlorpyrifos	4	16	2921-88-2
Chromium (VI)[3]	100	400	
m-Cresol	4,000	16,000	108-39-4
o-Cresol	4,000	16,000	95-48-7
p-Cresol	4,000	16,000	106-44-5
Cresol (total)	4,000	16,000	1319-77-3
Cyanide (amenable)[4]	70	280	
Cyanide (total)	320	1,280	
2,4-D	200	800	94-75-7
1,2-Dichlorobenzene	86	344	95-50-1
1,4-Dichlorobenzene	150	600	106-46-7
1,2-Dichloroethane	10	40	107-06-2
1,1-Dichloroethylene	14	56	75-35-4
Dichloromethane	172	688	75-09-2
2,4-Dinitrotoluene	2.6	10.4	121-14-2
Endosulfan[5]	60	240	See below[5]
Ethylbenzene	600	2,400	100-41-4
Fluoride	3,000	12,000	
Fluroxypyr	40	160	69377-81-7
Lead	100	400	

Contaminant	Maximum values of *specific contaminant concentration* (SCC) for classification without TCLP		CAS Registry Number
	General solid waste[1]	Restricted solid waste	
	CT1 (mg/kg)	CT2 (mg/kg)	
Mercury	4	16	
Methyl ethyl ketone	4,000	16,000	78-93-3
Moderately harmful pesticides[6] (total)	250	1,000	See below[6]
Molybdenum	100	400	
Nickel	40	160	
Nitrobenzene	40	160	98-95-3
C6–C9 petroleum hydrocarbons[7]	650	2,600	
C10–C36 petroleum hydrocarbons[7]	10,000	40,000	
Phenol (non-halogenated)	288	1,152	108-95-2
Picloram	60	240	1918-02-1
Plasticiser compounds[8]	20	80	See below[8]
Polychlorinated biphenyls[9]	<50	<50	1336-36-3
Polycyclic aromatic hydrocarbons (total)[10]	200	800	
Scheduled chemicals[11]	<50	<50	
Selenium	20	80	
Silver	100	400	
Styrene (vinyl benzene)	60	240	100-42-5
Tebuconazole	128	512	107534-96-3
1,2,3,4-Tetrachlorobenzene	10	40	634-66-2
1,1,1,2-Tetrachloroethane	200	800	630-20-6
1,1,2,2-Tetrachloroethane	26	104	79-34-5
Tetrachloroethylene	14	56	127-18-4
Toluene	288	1,152	108-88-3
1,1,1-Trichloroethane	600	2,400	71-55-6
1,1,2-Trichloroethane	24	96	79-00-5
Trichloroethylene	10	40	79-01-6
2,4,5-Trichlorophenol	8,000	32,000	95-95-4
2,4,6-Trichlorophenol	40	160	88-06-2
Triclopyr	40	160	55335-06-3

Contaminant	Maximum values of *specific contaminant concentration* (SCC) for classification without TCLP		CAS Registry Number
	General solid waste[1]	Restricted solid waste	
	CT1 (mg/kg)	CT2 (mg/kg)	
Vinyl chloride	4	16	75-01-4
Xylenes (total)	1,000	4,000	1330-20-7

Notes

1. Values are the same for general solid waste (putrescible) and general solid waste (non-putrescible).
2. There may be a need for the laboratory to concentrate the sample to achieve the TCLP limit value for benzo(a)pyrene with confidence.
3. These limits apply to chromium in the +6 oxidation state only.
4. Analysis for cyanide (amenable) is the established method for assessing potentially leachable cyanide. The EPA may consider other methods if it can be demonstrated that these methods yield the same information.
5. Endosulfan (CAS Registry Number 115-29-7) means the total of Endosulfan I (CAS Registry Number 959-98-8), Endosulfan II (CAS Registry Number 891-86-1) and Endosulfan sulfate (CAS Registry Number 1031-07-8).
6. The following moderately harmful pesticides are to be included in the total values specified:

Moderately harmful pesticides (total)			
Name	CAS Registry Number	Name	CAS Registry Number
Atrazine	1912-24-9	Imidacloprid	138261-41-3
Azoxystrobin	131860-33-8	Indoxacarb	173584-44-6
Bifenthrin	82657-04-3	Malathion (Maldison)	121-75-5
Brodifacoum	56073-10-0	Metalaxyl	57837-19-1
Carboxin	5234-68-4	Metalaxyl-M	70630-17-0
Copper naphthenate	1338-02-9	Methidathion	950-37-8
Cyfluthrin	68359-37-5	3-Methyl-4-chlorophenol	59-50-7
Cyhalothrin	68085-85-8	Methyl chlorpyrifos	5598-13-0
Cypermethrin	52315-07-08	N-Methyl pyrrolidone	872-50-4
Deltamethrin	52918-63-5	2-octylthiazol-3-one	26530-20-1
Dichlofluanid	1085-98-9	Oxyfluorfen	42874-03-3
Dichlorvos	62-73-7	Paraquat dichloride	1910-42-5
Difenoconazole	119446-68-3	Parathion methyl	298-00-0
Dimethoate	60-51-5	Permethrin	52645-53-1
Diquat dibromide	85-00-7	Profenofos	41198-08-7
Emamectin benzoate	137515-75-4 & 155569-91-8	Prometryn	7287-19-6
Ethion	563-12-2	Propargite	2312-35-8
Fenthion	55-38-9	Pentachloronitrobenzene (Quintozene)	82-68-8
Fenitrothion	122-14-5	Simazine	122-34-9
Fipronil	120068-37-3	Thiabendazole	148-79-8

Moderately harmful pesticides (total)			
Name	**CAS Registry Number**	**Name**	**CAS Registry Number**
Fluazifop-P-butyl	79241-46-6	Thiamethoxam	153719-23-4
Fludioxonil	131341-86-1	Thiodicarb	59669-26-0
Glyphosate	1071-83-6	Thiram	137-26-8

7. Approximate range of petroleum hydrocarbon fractions: petrol C6–C9, kerosene C10–C18, diesel C12–C18, and lubricating oils above C18. Laboratory results are reported as four different fractions: C6–C9, C10–C14, C15–C28 and C29–C36. The results of total petroleum hydrocarbons (TPH) (C10–C36) analyses are reported as a sum of the relevant three fractions. Please note that hydrocarbons are defined as molecules that only contain carbon and hydrogen atoms. Prior to TPH (C10–C36) analysis, clean-up may be necessary to remove non-petroleum hydrocarbon compounds. Where the presence of other materials that will interfere with the analysis may be present, such as oils and fats from food sources, you are advised to treat the extract that has been solvent exchanged to hexane with silica gel as described in *USEPA Method 1664A* (USEPA 2000).
8. Plasticiser compounds means the total of di-2-ethyl hexyl phthalate (CAS Registry Number 117-81-7) and di-2-ethyl hexyl adipate (CAS Registry Number 103-23-1) contained within a waste.
9. Polychlorinated biphenyls must be managed in accordance with the EPA's polychlorinated biphenyl (PCB) chemical control order 1997, which is available on the EPA website at www.epa.nsw.gov.au/resources/pesticides/pcbcco1997.pdf.
10. The following polycyclic aromatic hydrocarbons (PAHs) are assessed as the total concentration of 16 USEPA Priority Pollutant PAHs, as follows:

Polycyclic aromatic hydrocarbons (total)			
PAH name	**CAS Registry Number**	**PAH name**	**CAS Registry Number**
Acenaphthene	83-32-9	Chrysene	218-01-9
Acenaphthylene	208-96-8	Dibenzo(a,h)anthracene	53-70-3
Anthracene	120-12-7	Fluoranthene	206-44-0
Benzo(a)anthracene	56-55-3	Fluorene	86-73-7
Benzo(a)pyrene	50-32-8	Indeno(1,2,3-cd)pyrene	193-39-5
Benzo(b)fluoranthene	205-99-2	Naphthalene	91-20-3
Benzo(ghi)perylene	191-24-2	Phenanthrene	85-01-8
Benzo(k)fluoranthene	207-08-9	Pyrene	129-00-0

11. Scheduled chemicals must be managed in accordance with the EPA's scheduled chemical wastes chemical control order 2004, which is available on the EPA website at www.epa.nsw.gov.au/resources/pesticides/scwcco2004.pdf.

    The following scheduled chemicals are to be included in the total values specified:

Scheduled chemicals (total)			
Name	**CAS Registry Number**	**Name**	**CAS Registry Number**
Aldrin	309-00-2	Heptachlor	76-44-8
Alpha-BHC	319-84-6	Heptachlor epoxide	1024-57-3
Beta-BHC	319-85-7	Hexachlorobenzene	118-74-1
Gamma-BHC (Lindane)	58-89-9	Hexachlorophene	70-30-4
Delta-BHC	319-86-8	Isodrin	465-73-6

Scheduled chemicals (total)			
Name	**CAS Registry Number**	**Name**	**CAS Registry Number**
Chlordane	57-74-9	Pentachlorobenzene	608-93-5
DDD	72-54-8	Pentachloronitrobenzene	82-68-8
DDE	72-55-9	Pentachlorophenol	87-86-5
DDT	50-29-3	1,2,4,5-Tetrachlorobenzene	95-94-3
Dieldrin	60-57-1	2,3,4,6-Tetrachlorophenol	58-90-2
Endrin	72-20-8	1,2,4-Trichlorobenzene	120-82-1
Endrin aldehyde	7421-93-4	2,4,5-Trichlorophenoxyacetic acid, salts and esters	93-76-5

Table 2: TCLP and SCC values for classifying waste by chemical assessment

For disposal requirements for organic and inorganic chemical contaminants not listed below, contact the EPA. Aluminium, barium, boron, chromium (0 and III oxidation states), cobalt, copper, iron, manganese, vanadium and zinc have not been listed with values in this table and need not be tested for.

Contaminant	Maximum values for *leachable concentration* and *specific contaminant concentration* when used together				CAS Registry Number
	General solid waste[1]		Restricted solid waste		
	Leachable concentration	Specific contaminant concentration	Leachable concentration	Specific contaminant concentration	
	TCLP1 (mg/L)	SCC1 (mg/kg)	TCLP2 (mg/L)	SCC2 (mg/kg)	
Arsenic	5.0[2]	500	20	2,000	
Benzene	0.5[2]	18	2	72	71-43-2
Benzo(a)pyrene[3]	0.04[4]	10	0.16	23	50-32-8
Beryllium	1.0[5]	100	4	400	
Cadmium	1.0[2]	100	4	400	
Carbon tetrachloride	0.5[2]	18	2	72	56-23-5
Chlorobenzene	100[2]	3,600	400	14,400	108-90-7
Chloroform	6[2]	216	24	864	67-66-3
Chlorpyrifos	0.2	7.5	0.8	30	2921-88-2
Chromium (VI)[6]	5[2]	1,900	20	7,600	
m-Cresol	200[2]	7,200	800	28,800	108-39-4
o-Cresol	200[2]	7,200	800	28,800	95-48-7
p-Cresol	200[2]	7,200	800	28,800	106-44-5
Cresol (total)	200[2]	7,200	800	28,800	1319-77-3
Cyanide (amenable)[7, 8]	3.5[7]	300	14	1,200	
Cyanide (total)[7]	16[7]	5,900	64	23,600	
2,4-D	10[2]	360	40	1,440	94-75-7
1,2-Dichlorobenzene	4.3[2]	155	17.2	620	95-50-1
1,4-Dichlorobenzene	7.5[2]	270	30	1,080	106-46-7
1,2-Dichloroethane	0.5[2]	18	2	72	107-06-2
1,1-Dichloroethylene	0.7[2]	25	2.8	100	75-35-4
Dichloromethane	8.6[2]	310	34.4	1,240	75-09-2
2,4-Dinitrotoluene	0.13[2]	4.68	0.52	18.7	121-14-2
Endosulfan[9]	3	108	12	432	See below[9]

Contaminant	Maximum values for *leachable concentration* and *specific contaminant concentration* when used together				CAS Registry Number
	General solid waste[1]		Restricted solid waste		
	Leachable concentration	Specific contaminant concentration	Leachable concentration	Specific contaminant concentration	
	TCLP1 (mg/L)	SCC1 (mg/kg)	TCLP2 (mg/L)	SCC2 (mg/kg)	
Ethylbenzene	30[10]	1,080	120	4,320	100-41-4
Fluoride	150[10]	10,000	600	40,000	
Fluroxypyr	2	75	8	300	69377-81-7
Lead	5[2]	1,500	20	6,000	
Mercury	0.2[2]	50	0.8	200	
Methyl ethyl ketone	200[2]	7,200	800	28,800	78-93-3
Moderately harmful pesticides[11](total)	N/A[12]	250	N/A[12]	1,000	See below[11]
Molybdenum	5[10]	1,000	20	4,000	
Nickel	2[10]	1,050	8	4,200	
Nitrobenzene	2[2]	72	8	288	98-95-3
C6–C9 petroleum hydrocarbons[13]	N/A[12]	650	N/A[12]	2,600	
C10–C36 petroleum hydrocarbons[13]	N/A[12]	10,000	N/A[12]	40,000	
Phenol (non-halogenated)	14.4[14]	518	57.6	2,073	108-95-2
Picloram	3	110	12	440	1918-02-1
Plasticiser compounds[15]	1	600	4	2,400	See below[15]
Polychlorinated biphenyls[12]	N/A[12]	< 50	N/A[12]	< 50	1336-36-3
Polycyclic aromatic hydrocarbons (total)[16]	N/A[12]	200	N/A[12]	800	
Scheduled chemicals[17]	N/A[12]	< 50	N/A[12]	< 50	See below[17]
Selenium	1[2]	50	4	200	
Silver	5.0[2]	180	20	720	
Styrene (vinyl benzene)	3[10]	108	12	432	100-42-5
Tebuconazole	6.4	230	25.6	920	107534-96-3
1,2,3,4-Tetrachlorobenzene	0.5	18	2	72	634-66-2

Contaminant	Maximum values for *leachable concentration* and *specific contaminant concentration* when used together				CAS Registry Number
	General solid waste[1]		Restricted solid waste		
	Leachable concentration	Specific contaminant concentration	Leachable concentration	Specific contaminant concentration	
	TCLP1 (mg/L)	SCC1 (mg/kg)	TCLP2 (mg/L)	SCC2 (mg/kg)	
1,1,1,2-Tetrachloroethane	10[2]	360	40	1,440	630-20-6
1,1,2,2-Tetrachloroethane	1.3[2]	46.8	5.2	187.2	79-34-5
Tetrachloroethylene	0.7[2]	25.2	2.8	100.8	127-18-4
Toluene	14.4[14]	518	57.6	2,073	108-88-3
1,1,1-Trichloroethane	30[2]	1,080	120	4,320	71-55-6
1,1,2-Trichloroethane	1.2[2]	43.2	4.8	172.8	79-00-5
Trichloroethylene	0.5[2]	18	2	72	79-01-6
2,4,5-Trichlorophenol	400[2]	14,400	1,600	57,600	95-95-4
2,4,6-Trichlorophenol	2[2]	72	8	288	88-06-2
Triclopyr	2	75	8	300	55335-06-3
Vinyl chloride	0.2[2]	7.2	0.8	28.8	75-01-4
Xylenes (total)	50[18]	1,800	200	7,200	1330-20-7

Notes

1. Values are the same for general solid waste (putrescible) and general solid waste (non- putrescible).
2. See *Hazardous Waste Management System: Identification and Listing of Hazardous Waste – Toxicity Characteristics Revisions, Final Rule* (USEPA 2012b) for TCLP levels.
3. There may be a need for the laboratory to concentrate the sample to achieve the TCLP limit value for benzo(a)pyrene with confidence.
4. Calculated from *Hazardous Waste: Identification and Listing* (USEPA 2012a).
5. Calculated from 'Beryllium' in *The Health Risk Assessment and Management of Contaminated Sites* (DiMarco & Buckett 1996).
6. These limits apply to chromium in the +6 oxidation state only.
7. Taken from the *Land Disposal Restrictions for Newly Identified and Listed Hazardous Wastes and Hazardous Soil: Proposed Rule* (USEPA 1993).
8. Analysis for cyanide (amenable) is the established method used to assess the potentially leachable cyanide. The EPA may consider other methods if it can be demonstrated that these methods yield the same information.
9. Endosulfan (CAS Registry Number 115-29-7) means the total of endosulfan I (CAS Registry Number 959-98-8), endosulfan II (CAS Registry Number 891-86-1) and endosulfan sulfate (CAS Registry Number 1031-07-8).
10. Calculated from *Australian Drinking Water Guidelines* (NHMRC 2011).
11. The following moderately harmful pesticides are to be included in the total values specified:

Moderately harmful pesticides (total)			
Name	**CAS Registry Number**	**Name**	**CAS Registry Number**
Atrazine	1912-24-9	Imidacloprid	138261-41-3
Azoxystrobin	131860-33-8	Indoxacarb	173584-44-6
Bifenthrin	82657-04-3	Malathion (Maldison)	121-75-5
Brodifacoum	56073-10-0	Metalaxyl	57837-19-1
Carboxin	5234-68-4	Metalaxyl-M	70630-17-0
Copper naphthenate	1338-02-9	Methidathion	950-37-8
Cyfluthrin	68359-37-5	3-Methyl-4-chlorophenol	59-50-7
Cyhalothrin	68085-85-8	Methyl chlorpyrifos	5598-13-0
Cypermethrin	52315-07-08	N-Methyl pyrrolidone	872-50-4
Deltamethrin	52918-63-5	2-octylthiazol-3-one	26530-20-1
Dichlofluanid	1085-98-9	Oxyfluorfen	42874-03-3
Dichlorvos	62-73-7	Paraquat dichloride	1910-42-5
Difenoconazole	119446-68-3	Parathion methyl	298-00-0
Dimethoate	60-51-5	Permethrin	52645-53-1
Diquat dibromide	85-00-7	Profenofos	41198-08-7
Emamectin benzoate	137515-75-4 & 155569-91-8	Prometryn	7287-19-6
Ethion	563-12-2	Propargite	2312-35-8
Fenthion	55-38-9	Pentachloronitrobenzene (Quintozene)	82-68-8
Fenitrothion	122-14-5	Simazine	122-34-9
Fipronil	120068-37-3	Thiabendazole	148-79-8
Fluazifop-P-butyl	79241-46-6	Thiamethoxam	153719-23-4
Fludioxonil	131341-86-1	Thiodicarb	59669-26-0
Glyphosate	1071-83-6	Thiram	137-26-8

12. No TCLP analysis is required. Moderately harmful pesticides, petroleum hydrocarbons, polychlorinated biphenyls, polycyclic aromatic hydrocarbons and scheduled chemicals are assessed using SCC1 and SCC2.

    Polychlorinated biphenyls must be managed in accordance with the EPA's polychlorinated biphenyl (PCB) chemical control order 1997, which is available on the EPA website at www.epa.nsw.gov.au/resources/pesticides/pcbcco1997.pdf.

13. Approximate range of petroleum hydrocarbon fractions: petrol C6–C9, kerosene C10–C18, diesel C12–C18, and lubricating oils above C18. Laboratory results are reported as four different fractions: C6–C9, C10–C14, C15–C28 and C29–C36. The results of total petroleum hydrocarbons (C10–C36) analyses are reported as a sum of the relevant three fractions. Please note that hydrocarbons are defined as molecules that only contain carbon and hydrogen atoms. Prior to TPH (C10–C36) analysis, clean-up may be necessary to remove non-petroleum hydrocarbon compounds. Where the presence of other materials that will interfere with the analysis may be present, such as oils and fats from food sources, you are advised to treat the extract that has been solvent exchanged to hexane with silica gel as described in USEPA *Method 1664A* (USEPA 2000).
14. Proposed level for phenol and toluene in *Hazardous Waste Management System: Identification and Listing of Hazardous Waste – Toxicity Characteristics Revisions, Final Rule* (USEPA 2012b).

15. Plasticiser compounds means the total of di-2-ethyl hexyl phthalate (CAS Registry Number 117-81-7) and di-2-ethyl hexyl adipate (CAS Registry Number 103-23-1) contained within a waste.
16. The following polycyclic aromatic hydrocarbons are assessed as the total concentration of 16 USEPA Priority Pollutant PAHs, as follows:

Polycyclic aromatic hydrocarbons (total)			
PAH name	**CAS Registry Number**	**PAH name**	**CAS Registry Number**
Acenaphthene	83-32-9	Chrysene	218-01-9
Acenaphthylene	208-96-8	Dibenzo(a,h)anthracene	53-70-3
Anthracene	120-12-7	Fluoranthene	206-44-0
Benzo(a)anthracene	56-55-3	Fluorene	86-73-7
Benzo(a)pyrene	50-32-8	Indeno(1,2,3-cd)pyrene	193-39-5
Benzo(b)fluoranthene	205-99-2	Naphthalene	91-20-3
Benzo(ghi)perylene	191-24-2	Phenanthrene	85-01-8
Benzo(k)fluoranthene	207-08-9	Pyrene	129-00-0

17. Scheduled chemicals must be managed in accordance with the EPA's scheduled chemical wastes chemical control order 2004, which is available on the EPA website at www.epa.nsw.gov.au/resources/pesticides/scwcco2004.pdf.

    The following scheduled chemicals are to be included in the total values specified:

Scheduled chemicals (total)			
Name	**CAS Registry Number**	**Name**	**CAS Registry Number**
Aldrin	309-00-2	Heptachlor	76-44-8
Alpha-BHC	319-84-6	Heptachlor epoxide	1024-57-3
Beta-BHC	319-85-7	Hexachlorobenzene	118-74-1
Gamma-BHC (Lindane)	58-89-9	Hexachlorophene	70-30-4
Delta-BHC	319-86-8	Isodrin	465-73-6
Chlordane	57-74-9	Pentachlorobenzene	608-93-5
DDD	72-54-8	Pentachloronitrobenzene	82-68-8
DDE	72-55-9	Pentachlorophenol	87-86-5
DDT	50-29-3	1,2,4,5-Tetrachlorobenzene	95-94-3
Dieldrin	60-57-1	2,3,4,6-Tetrachlorophenol	58-90-2
Endrin	72-20-8	1,2,4-Trichlorobenzene	120-82-1
Endrin aldehyde	7421-93-4	2,4,5-Trichlorophenoxyacetic acid, salts and esters	93-76-5

18. Calculated from *Guidelines for Drinking Water Quality* (WHO 2011).

Table 3: Summary of criteria for chemical assessment to determine waste classification

Waste classification	Criteria[1] for classification by chemical assessment (any of the alternative options given)	Comments
General solid waste	1. SCC test values ≤ CT1	TCLP test not required
	2. TCLP test values ≤ TCLP1 and SCC test values ≤ SCC1	
	3. TCLP test values ≤ TCLP1 and SCC test values > SCC1[2]	Classify as restricted solid or hazardous (as applicable) If immobilisation approval applies, classify in accordance with that approval
Restricted solid waste	1. SCC test values ≤ CT2	TCLP test not required
	2. TCLP1 < TCLP test values ≤ TCLP2 and SCC test values ≤ SCC2	
	3.TCLP test values ≤ TCLP2 and SCC1 < SCC test values ≤ SCC2	
	4. TCLP1 < TCLP test values ≤ TCLP2 and SCC test values > SCC2[2]	Classify as hazardous. If immobilisation approval applies, classify in accordance with that approval
Hazardous waste	1. TCLP test values > TCLP 2	
	2. TCLP test values ≤ TCLP2 and SCC test values > SCC2	Classify as hazardous if no immobilization approval applies

Notes

1. These criteria apply to each toxic and ecotoxic contaminant present in the waste (see Tables 1 and 2).
2. In certain cases the EPA will consider specific conditions, such as segregation of the waste from all other types of waste in a monofill or monocell in order to achieve a greater margin of safety against a possible failure of the immobilisation in the future. Information about the construction and operation of a monofill/monocell is available in the *Draft Environmental Guidelines for Industrial Waste Landfilling* (EPA 1998).

APPENDIX K

GROUNDWATER LOGS

Aargus

Aargus Pty Ltd
6 Carter St
Lidcombe, NSW
Telephone: 1300137138
Fax: 1300136038

BOREHOLE NUMBER BH17

CLIENT Iris Capital Pty Ltd **PROJECT NAME** Aargus Pty Ltd

PROJECT NUMBER ES8338 **PROJECT LOCATION** 167 Hume Highway, Greenacre NSW

DATE STARTED 8/31/21 **COMPLETED** 8/31/21 **R.L. SURFACE** _____ **DATUM** _____

DRILLING CONTRACTOR BG Drilling **SLOPE** 90° **BEARING** NA

EQUIPMENT Track-mounted rig **HOLE LOCATION** _____

HOLE SIZE 50mm **LOGGED BY** SBS **CHECKED BY** MK

NOTES Subsurface levels are approximate

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture	Con. / Den.	Additional Observations
ADT	Not encountered		0.0			FILL. Sandy Clay, low plasticity, dark brown, with grass rootlets.				FILL/TOPSOIL
						FILL. Sandy Clay, low plasticity, pale to dark brown, with medium gravel and asphalt pieces.		M		FILL
			1.0		CH	Silty CLAY, high plasticity, orange to grey, pale brown.		M		RESIDUAL SOIL
			2.0			SHALE, grey, highly weathered.		M		BEDROCK
			5.0							

Aargus Pty Ltd
6 Carter St
Lidcombe, NSW
Telephone: 1300137138
Fax: 1300136038

BOREHOLE NUMBER BH17

CLIENT Iris Capital Pty Ltd **PROJECT NAME** Aargus Pty Ltd

PROJECT NUMBER ES8338 **PROJECT LOCATION** 167 Hume Highway, Greenacre NSW

DATE STARTED 8/31/21 **COMPLETED** 8/31/21 **R.L. SURFACE** _____ **DATUM** _____

DRILLING CONTRACTOR BG Drilling **SLOPE** 90° **BEARING** NA

EQUIPMENT Track-mounted rig **HOLE LOCATION** _____

HOLE SIZE 50mm **LOGGED BY** SBS **CHECKED BY** MK

NOTES Subsurface levels are approximate

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture	Con. / Den.	Additional Observations
ADT						SHALE, grey, highly weathered. *(continued)*		M		
			5.5			TC-bit refusal. EOH at 5.2m depth. Borehole BH17 terminated at 5.2m				
			6.0							
			6.5							
			7.0							
			7.5							
			8.0							
			8.5							
			9.0							
			9.5							
			10.0							

Aargus Pty Ltd
6 Carter St
Lidcombe, NSW
Telephone: 1300137138
Fax: 1300136038

BOREHOLE NUMBER GW1/BH1

CLIENT Iris Capital Pty Ltd **PROJECT NAME** Aargus Pty Ltd

PROJECT NUMBER ES8338 **PROJECT LOCATION** 167 Hume Highway, Greenacre NSW

DATE STARTED 8/31/21 **COMPLETED** 8/31/21 **R.L. SURFACE** _____ **DATUM** _____

DRILLING CONTRACTOR BG Drilling **SLOPE** 90° **BEARING** NA

EQUIPMENT Track-mounted rig **HOLE LOCATION** See site plan

HOLE SIZE 50mm **LOGGED BY** SBS **CHECKED BY** MK

NOTES Subsurface levels are approximate

Method	Water	Well Details	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture	Con. / Den.	Additional Observations
ADT				0.0			CONCRETE. 300mm.				PAVEMENT
				0.5			FILL. Sandy Clay, low to medium plasticity, dark brown, with medium gravel and asphalt pieces.		M		FILL
						CI	Silty CLAY, medium plasticity, pale brown to grey.		M		RESIDUAL SOIL
				1.0		CH	Silty CLAY, high plasticity, orange to grey.				
				1.5							
				2.0							
				2.5					M		
				3.0							
				3.5							
				4.0			SHALE, grey, highly weathered.				BEDROCK
				4.5					M		
				5.0							

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BOREHOLE NUMBER GW1/BH1

CLIENT Iris Capital Pty Ltd **PROJECT NAME** Aargus Pty Ltd

PROJECT NUMBER ES8338 **PROJECT LOCATION** 167 Hume Highway, Greenacre NSW

DATE STARTED 8/31/21 **COMPLETED** 8/31/21 **R.L. SURFACE** _____ **DATUM** _____

DRILLING CONTRACTOR BG Drilling **SLOPE** 90° **BEARING** NA

EQUIPMENT Track-mounted rig **HOLE LOCATION** See site plan

HOLE SIZE 50mm **LOGGED BY** SBS **CHECKED BY** MK

NOTES Subsurface levels are approximate

Method	Water	Well Details	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture	Con. / Den.	Additional Observations
ADT	2-Sept-2021			5.5			SHALE, grey, highly weathered. *(continued)*				
				6.0							
				6.5							
				7.0					M		
				7.5							
				8.0							
				8.5							
				9.0			SHALE, grey.		M		
				9.5			TC-bit refusal. EOH at 9.1m depth. Borehole GW1/BH1 terminated at 9.1m				
				10.0							

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BOREHOLE NUMBER GW2/BH4

CLIENT Iris Capital Pty Ltd **PROJECT NAME** Aargus Pty Ltd

PROJECT NUMBER ES8338 **PROJECT LOCATION** 167 Hume Highway, Greenacre NSW

DATE STARTED 8/31/21 **COMPLETED** 8/31/21 **R.L. SURFACE** _____ **DATUM** _____

DRILLING CONTRACTOR BG Drilling **SLOPE** 90° **BEARING** NA

EQUIPMENT Track-mounted rig **HOLE LOCATION** _____

HOLE SIZE 50mm **LOGGED BY** SBS **CHECKED BY** MK

NOTES Subsurface levels are approximate

Method	Water	Well Details	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture	Con. / Den.	Additional Observations
ADT				0.0			ASPHALT. 200mm.				PAVEMENT
				0.5			FILL. Sandy Clay, low to medium plasticity, dark brown, with medium gravel and asphalt pieces.		M		FILL
				1.0		CH	Silty CLAY, high plasticity, orange to grey, pale brown.		M		RESIDUAL SOIL
				2.0			SHALE, grey, highly weathered.		M		BEDROCK
				2.5							
				3.0							
				3.5							
				4.0							
				4.5							
				5.0							

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BOREHOLE NUMBER GW2/BH4

CLIENT Iris Capital Pty Ltd **PROJECT NAME** Aargus Pty Ltd

PROJECT NUMBER ES8338 **PROJECT LOCATION** 167 Hume Highway, Greenacre NSW

DATE STARTED 8/31/21 **COMPLETED** 8/31/21 **R.L. SURFACE** _____ **DATUM** _____

DRILLING CONTRACTOR BG Drilling **SLOPE** 90° **BEARING** NA

EQUIPMENT Track-mounted rig **HOLE LOCATION** _____

HOLE SIZE 50mm **LOGGED BY** SBS **CHECKED BY** MK

NOTES Subsurface levels are approximate

Method	Water	Well Details	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture	Con. / Den.	Additional Observations
ADT	2-Sept-2021 ▼			5.5			SHALE, grey, highly weathered. *(continued)*		M		
				6.0							
				6.5							
				7.0							
				7.5							
				8.0							
				8.5							
				9.0			SHALE, grey.		M		
				9.5			TC-bit refusal. EOH at 9.1m depth. Borehole GW2/BH4 terminated at 9.1m				
				10.0							

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BOREHOLE NUMBER GW4/BH21

CLIENT Iris Capital Pty Ltd **PROJECT NAME** Aargus Pty Ltd

PROJECT NUMBER ES8338 **PROJECT LOCATION** 167 Hume Highway, Greenacre NSW

DATE STARTED 8/31/21 **COMPLETED** 8/31/21 **R.L. SURFACE** _____ **DATUM** _____

DRILLING CONTRACTOR BG Drilling **SLOPE** 90° **BEARING** NA

EQUIPMENT Track-mounted rig **HOLE LOCATION** _____

HOLE SIZE 50mm **LOGGED BY** SBS **CHECKED BY** MK

NOTES Subsurface levels are approximate

Method	Water	Well Details	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture	Con. / Den.	Additional Observations
ADT	Not encountered			0.0			FILL. Sandy Clay, low to medium plasticity, dark brown, with fine gravel, trace of glass and plastic pieces.		M		FILL
						CH	Silty CLAY, high plasticity, orange to grey, pale brown.		M		RESIDUAL SOIL
				2.5			SHALE, grey, highly weathered.		M		BEDROCK

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BOREHOLE NUMBER GW4/BH21

CLIENT Iris Capital Pty Ltd **PROJECT NAME** Aargus Pty Ltd

PROJECT NUMBER ES8338 **PROJECT LOCATION** 167 Hume Highway, Greenacre NSW

DATE STARTED 8/31/21 **COMPLETED** 8/31/21 **R.L. SURFACE** _____ **DATUM** _____

DRILLING CONTRACTOR BG Drilling **SLOPE** 90° **BEARING** NA

EQUIPMENT Track-mounted rig **HOLE LOCATION** _____

HOLE SIZE 50mm **LOGGED BY** SBS **CHECKED BY** MK

NOTES Subsurface levels are approximate

Method	Water	Well Details	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture	Con. / Den.	Additional Observations
ADT				5.5			SHALE, grey, highly weathered. *(continued)*		M		
				6.0							
				6.5							
				7.0							
				7.5							
				8.0			TC-bit refusal. EOH at 7.7m depth. Borehole GW4/BH21 terminated at 7.7m				
				8.5							
				9.0							
				9.5							
				10.0							

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BOREHOLE NUMBER GW5/BH8

CLIENT Iris Capital Pty Ltd **PROJECT NAME** Aargus Pty Ltd

PROJECT NUMBER ES8338 **PROJECT LOCATION** 167 Hume Highway, Greenacre NSW

DATE STARTED 8/31/21 **COMPLETED** 8/31/21 **R.L. SURFACE** _____ **DATUM** _____

DRILLING CONTRACTOR BG Drilling **SLOPE** 90° **BEARING** NA

EQUIPMENT Track-mounted rig **HOLE LOCATION** _____

HOLE SIZE 50mm **LOGGED BY** SBS **CHECKED BY** MK

NOTES Subsurface levels are approximate

Method	Water	Well Details	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture	Con. / Den.	Additional Observations
ADT				0.0			FILL. Sandy Clay, low to medium plasticity, dark brown, with fine gravel and glass pieces.		M		FILL
				0.5		CI	Silty CLAY, medium plasticity, pale brown to grey.		M		RESIDUAL SOIL
				1.0		CH	Silty CLAY, high plasticity, orange to grey.		M		
				3.0			SHALE, grey, highly weathered.		M		BEDROCK
				5.0							

Aargus Pty Ltd
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Lidcombe, NSW
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BOREHOLE NUMBER GW5/BH8

CLIENT Iris Capital Pty Ltd **PROJECT NAME** Aargus Pty Ltd

PROJECT NUMBER ES8338 **PROJECT LOCATION** 167 Hume Highway, Greenacre NSW

DATE STARTED 8/31/21 **COMPLETED** 8/31/21 **R.L. SURFACE** _____ **DATUM** _____

DRILLING CONTRACTOR BG Drilling **SLOPE** 90° **BEARING** NA

EQUIPMENT Track-mounted rig **HOLE LOCATION** _____

HOLE SIZE 50mm **LOGGED BY** SBS **CHECKED BY** MK

NOTES Subsurface levels are approximate

Method	Water	Well Details	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture	Con. / Den.	Additional Observations
ADT	2-Sept-2021			5.5			SHALE, grey, highly weathered. *(continued)*		M		
				6.0							
				6.5							
				7.0							
				7.5							
				8.0							
				8.5			TC-bit refusal. EOH at 8.4m depth. Borehole GW5/BH8 terminated at 8.4m				
				9.0							
				9.5							
				10.0							

APPENDIX L

FIELD RECORD FORMS / CALIBRATION CERTIFICATES

Aargus

Site Inspection
Daily Worksheet Record

Aargus

PROJECT NAME: DSI	**PROJECT NO:** ES8838
CLIENT: Iris Capital	**DATE:** 31/08/21
SITE ADDRESS: 167, Hume highway, Greenacre.	
SITE CONTACT:	**PHONE:**
AARGUS REPRESENTATIVE: SAAD	
TITLE: Environmental Engineer	**PHONE:**
FIELD NOTES:	

Start Time 7:00AM	Finish Time 6:00PM
Weather SUNNY.	Rainfall (mm) NO
Wind Direction 14km/hr. North.	Wind Speed 14km/hr.
Humidity 51%	
Odours Present None.	Staining Present None.

Environmental and Safety Concerns

Actions	
Machinery onsite Mechanical Augers.	Equipment onsite Hand augers.
Site Safety Induction	Stormwater Control Sand bags.
Dust Suppression Water hose / Sand bags.	Traffic Control Not requiered.

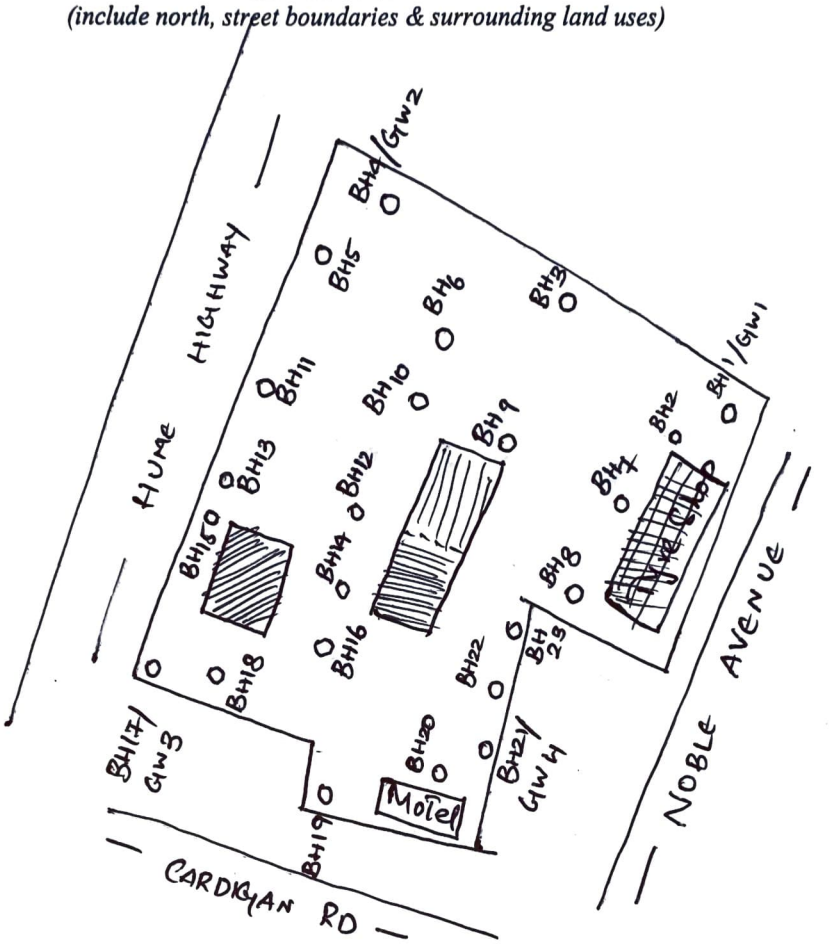
Description of Site Activities

E88338 – 167, Hume highway Greenacre. 31/08/21

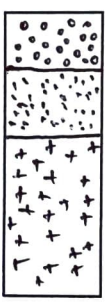
Aargus

SKETCH OF SITE PLAN

(include north, street boundaries & surrounding land uses)



SOIL PROFILE



Asphalt.

Fill/Topsoil (Sandy clay)

Natural (Clay)

LEGEND / NOTES

THE PALMS HOTEL BUILDING

MEMO's PIZZA SHOP.

YUMMY Restaurant

AUTOMOBILE SHOP.

BH – BORE HOLE.

GW – GROUND WATER.

31/08/21 ES8338 167 Hume highway, Gunnaroo

PID Measurements

Aargus

PID Monitor Description..... Model 580 E2 PID meter.

Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
BH 1 0.3-0.4	10.6	BH 1 0.5-0.6	3.6		
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
BH 2 0.3-0.4	40.5	BH2 0.5-0.6	26.3		
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
BH 3 0.2-0.3	5.6	BH3 0.6-0.7	1.4		
Location	PID (ppm)	Location	PID (ppm)	Location	PID level
BH 4 0.2-0.3	3.4	BH4 0.9-1.0	1.1		
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
BH 5 0.2-0.3	1.9	BH5 0.4-0.5	1.2		
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
BH 6 0.2-0.3	1.2	BH6 0.5-0.6	1.4		
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
BH 7 0.3-0.4	30.6	BH7 0.8-0.9	27.6		
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
BH 8 0.2-0.3	2.7	BH8 0.4-0.5	1.8		
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
BH 9 0.2-0.3	2.9	BH9 0.5-0.6	1.6		
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
BH 10 0.2-0.3	3.1	BH10 0.4-0.5	1.9		
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
BH 11 0.2-0.3	4.1	BH11 0.4-0.5	2.2		
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
BH 12 0.2-0.3	2.7	BH12 0.4-0.5	4.4		
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
BH 13 0.2-0.3	1.3	BH13 0.5-0.6	1.9		
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
BH 14 0.2-0.3	1.9	BH14 0.9-1.0	2.3		
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
BH 15 0.1-0.2	1.5	BH15 0.5-0.6	1.8		

31/08/21 E88338 167 Hume Highway Greenacre

PID Measurements

Aargus

PID Monitor Description: Model 580 E2 PID Meter

Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
BH16 0.2-0.3	3.2	BH16 0.5-0.6	2.6		
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
BH17 0.1-0.2	2.8	BH17 0.9-1.0	2.2		
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
BH18 0.1-0.2	4.0	BH18 0.8-0.9	3.3		
Location	PID (ppm)	Location	PID (ppm)	Location	PID level
BH19 0.1-0.2	2.6	BH19 0.6-0.7	2.2		
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
BH20 0.2-0.3	1.7	BH20 0.6-0.7	2.1		
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
BH21 0.1-0.2	1.9	BH21 0.3-0.4	1.6		
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
BH22 0.1-0.2	1.6	BH22 0.6-0.7	2.4		
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
BH23 0.1-0.2	3.7	BH23 0.6-0.7	3.0		
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)
Location	PID (ppm)	Location	PID (ppm)	Location	PID (ppm)

Aargus Pty Ltd

PID Certification Report

ES8838 : 167 Hume highway, Gerenaree, NSW.

This PID has been performance checked/calibrated as follows:

- [x] Calibrate 0.0ppm Reading 0.0 ppm
- [x] Calibrate 99.3 ppm isobutylene Reading 99.4 ppm
- [x] Charged
- [x] Filter check
- [x] Lamp check

Date: 31/08/2021

Checked by: SAADBIN SULEMAN

Signature:

Please check that the following items are contained within the PID Equipment Register

- [x] PID carry. case
- [x] Model 580 EZ PID meter
- [x] Charger
- [x] Adapter for charger
- [x] Calibration tube
- [x] Sample Probe
- [x] Water Filter Trap
- [ ] Computer cable connector
- [ ] Floppy disk software

Serial Number:

Aargus

GROUNDWATER MONITORING RECORD FORM

PROJECT INFORMATION			
Client:	IRIS CAPITAL	Monitoring Well ID:	GW1
Site Address:	167 Hume Hwy, Greenacre	Logged By:	SAAD
Project:	ES 8338 - DS1	Date:	2/09/21

MONITORING WELL DETAILS			
Depth (m) as constructed:	9.0 m	Depth (m) as measured:	8.97m
Finish:		Co-ordinates:	
Condition:		Surveyed Levels:	

METHODOLOGY AND EQUIPMENT			
Water Measurement Device:	Tape Measure	Reference Point:	GC
Water Quality Meter:		Reference Point to Ground Surface (mm):	0
GW Extraction Method:	Bailer		

GROUNDWATER GAUGING (PRE-PURGE)		GROUNDWATER GAUGING (POST-PURGE)	
SWL (m below reference point):	5.07	SWL (m below reference point):	6.13
SWL (m bgl)		SWL (m bgl)	
Depth to Product (m below reference point):		Depth to Product (m below reference point):	
Product Thickness (mm):		Product Thickness (mm):	
Time:		Time:	

PURGING AND PHYSICO-CHEMICAL PARAMETERS

Time (Started)	Time (Finished)	Volume Purged	Pump Rate (mL/min)	Temperature (°C)	DO (mg/L)	pH (pH units)	EC (µS/cm)	Redox Potential (mV)
10:15	10:20	2L		16.7	11.56	7.28	14396	208.5
10:20	10:25	2L		16.5	11.9	7.32	14501	208.9
10:25	10:30	2L		16.6	11.2	7.33	14456	209.2
		Stabilisation Criteria		± 0.2 °C	± 0.2 or ± 10%	± 0.05 pH units	± 3%	± 10 mV

OBSERVATIONS			
Odour:	None	Sheen:	None
Colour / Turbidity:	p brown / Grey / turbid	Recent Rain (Days):	

SAMPLING							
Samples Taken:	Primary	Blind		Split		Rinsate	TS/TB
Containers:							
Field Filtered:							
Preservation:							

Record Checked by:		Document Version:	0
Date:		Updated:	7/2/13

Aargus

GROUNDWATER MONITORING RECORD FORM

PROJECT INFORMATION			
Client:	Iris Capital	Monitoring Well ID:	GW 2
Site Address:	167, Hume highway, Greenacre	Logged By:	SAAD
Project:	ES8338 - DSI	Date:	02/09/21

MONITORING WELL DETAILS			
Depth (m) as constructed:	7.9	Depth (m) as measured:	7.86
Finish:		Co-ordinates:	
Condition:		Surveyed Levels:	

METHODOLOGY AND EQUIPMENT			
Water Measurement Device:	Tape Measure	Reference Point:	GC
Water Quality Meter:		Reference Point to Ground Surface (mm):	0
GW Extraction Method:	Bailer		

GROUNDWATER GAUGING (PRE-PURGE)		GROUNDWATER GAUGING (POST-PURGE)	
SWL (m below reference point):	6.5	SWL (m below reference point):	7.1
SWL (m bgl)	6.5	SWL (m bgl)	7.1
Depth to Product (m below reference point):		Depth to Product (m below reference point):	
Product Thickness (mm):		Product Thickness (mm):	
Time:		Time:	

PURGING AND PHYSICO-CHEMICAL PARAMETERS

Time (Started)	Time (Finished)	Volume Purged	Pump Rate (mL/min)	Temperature (°C)	DO (mg/L)	pH (pH units)	EC (µS/cm)	Redox Potential (mV)
10:40	10:44	2L		16.8	11.5	7.39	9094	210.5
10:45	10:49	2L		16.6	11.7	7.38	9208	211.2
10:50	10:55	2L		16.7	10.5	7.39	8148	212.3
		Stabilisation Criteria		±0.2 °C	±0.2 or ±10%	±0.05 pH units	±3%	±10 mV

OBSERVATIONS			
Odour:	None	Sheen:	None
Colour / Turbidity:	P. brown/grey/ highly Turbid	Recent Rain (Days):	

SAMPLING							
Samples Taken:	Primary	Blind		Split		Rinsate	TS/TB
Containers:							
Field Filtered:							
Preservation:							

Record Checked by:		Document Version:	0
Date:		Updated:	7/2/13

Aargus

GROUNDWATER MONITORING RECORD FORM

PROJECT INFORMATION			
Client:	Iris Capital	Monitoring Well ID:	GW 4
Site Address:	167 Hume Hwy, Greenacre	Logged By:	SAAD
Project:	ES8378 – DSI	Date:	02/09/21

MONITORING WELL DETAILS			
Depth (m) as constructed:	7.7	Depth (m) as measured:	6.65
Finish:		Co-ordinates:	
Condition:		Surveyed Levels:	

METHODOLOGY AND EQUIPMENT			
Water Measurement Device:	Tape Measure	Reference Point:	Pipe top
Water Quality Meter:		Reference Point to Ground Surface (mm):	700 mm
GW Extraction Method:	Hand Bailer		

GROUNDWATER GAUGING (PRE-PURGE)		GROUNDWATER GAUGING (POST-PURGE)	
SWL (m below reference point):	None	SWL (m below reference point):	None
SWL (m bgl)		SWL (m bgl)	
Depth to Product (m below reference point):		Depth to Product (m below reference point):	
Product Thickness (mm):		Product Thickness (mm):	
Time:		Time:	

PURGING AND PHYSICO-CHEMICAL PARAMETERS

Time (Started)	Time (Finished)	Volume Purged	Pump Rate (mL/min)	Temperature (°C)	DO (mg/L)	pH (pH units)	EC (µS/cm)	Redox Potential (mV)
			Stabilisation Criteria	± 0.2 °C	± 0.2 or ± 10%	± 0.05 pH units	± 3%	± 10 mV

OBSERVATIONS			
Odour:	None	Sheen:	None
Colour / Turbidity:	–	Recent Rain (Days):	–

SAMPLING							
Samples Taken:	Primary	Blind		Split		Rinsate	TS/TB
Containers:							
Field Filtered:							
Preservation:							

Record Checked by:		Document Version:	0
Date:		Updated:	7/2/13

Aargus

GROUNDWATER MONITORING RECORD FORM

PROJECT INFORMATION			
Client:	Iris Capital	Monitoring Well ID:	GWS
Site Address:	167, Hume highway Gunnawara	Logged By:	DAAD
Project:	E88338 – DSI	Date:	02/09/21

MONITORING WELL DETAILS			
Depth (m) as constructed:	9.0	Depth (m) as measured:	8.97
Finish:		Co-ordinates:	
Condition:		Surveyed Levels:	

METHODOLOGY AND EQUIPMENT			
Water Measurement Device:	Tape Measure	Reference Point:	Pipe top
Water Quality Meter:		Reference Point to Ground Surface (mm):	1220
GW Extraction Method:	Hand Bailer		

GROUNDWATER GAUGING (PRE-PURGE)		GROUNDWATER GAUGING (POST-PURGE)	
SWL (m below reference point):	8.01	SWL (m below reference point):	8.29
SWL (m bgl)	6.79	SWL (m bgl)	7.07
Depth to Product (m below reference point):		Depth to Product (m below reference point):	
Product Thickness (mm):		Product Thickness (mm):	
Time:		Time:	

PURGING AND PHYSICO-CHEMICAL PARAMETERS

Time (Started)	Time (Finished)	Volume Purged	Pump Rate (mL/min)	Temperature (°C)	DO (mg/L)	pH (pH units)	EC (µS/cm)	Redox Potential (mV)
11:00	11:04	2L		16.3	10.68	7.05	16081	222.1
11:05	11:09	2L		16.4	10.78	7.04	13060	221.7
11:10	11:15	2L		16.5	11.50	7.06	12348	221.3
		Stabilisation Criteria		± 0.2 °C	± 0.2 or ± 10%	± 0.05 pH units	± 3%	± 10 mV

OBSERVATIONS			
Odour:	None	Sheen:	None
Colour / Turbidity:	P. brown/grey highly turbid	Recent Rain (Days):	

SAMPLING							
Samples Taken:	Primary		Blind		Split	Rinsate	TS/TB
Containers:							
Field Filtered:							
Preservation:							

Record Checked by:		Document Version:	0
Date:		Updated:	7/2/13

Site Inspection
Daily Worksheet Record

Aargus

PROJECT NAME: DSI	**PROJECT NO:** ES8338
CLIENT: IRIS CAPITAL	**DATE:** 02/09/21
SITE ADDRESS: 16t, Hume highway, Greenacre, NSW	
SITE CONTACT:	**PHONE:**
AARGUS REPRESENTATIVE: SBS	
TITLE:	**PHONE:**
FIELD NOTES:	

Start Time	9:00 AM	Finish Time	11:00AM
Weather	SUNNY	Rainfall (mm)	NONE
Wind Direction	SOUTH	Wind Speed	26 km/hr.
Humidity	31%.		
Odours Present	None	Staining Present	None.

Environmental and Safety Concerns

None.

Actions

Machinery onsite	None	Equipment onsite	Hand baiters.
Site Safety Induction	Not required	Stormwater Control	Sand bags
Dust Suppression	None.	Traffic Control	Not required

APPENDIX M

LABORATORY TECHNICAL INFORMATION

Aargus

eurofins | Environment Testing

Recommended Preservation and Container Guide

Parameter	Container	Lab Analysis Portion (g) (1)	Eurofins Preferred Preservation	Recommended Holding Times
Acid Sulfate Soil (pH_{FIELD} & pH_{FOX})	P	50	Freeze, exclude air	24 hours #
Acid Sulfate Soil (SPOCAS/CrS)	P	50	Freeze, exclude air	24 hours #
Alcohols	G	20	Cool to less than 6°C, Zero Headspace	14 days*
Asbestos Containing Material (AS4964)	P, Doubled Bag	2 cm x 2cm (minimum)	None, separate sample required	indefinite
Asbestos (AS4964)	P	50	None, separate sample required	indefinite
Asbestos (NEPM or WA Guidelines)	P	500 mL	None, separate sample required	indefinite
BTEX / TRH (>C6-C10)	G	20	Cool to less than 6°C, Zero Headspace	14 days*
Bulk Density	G	500		14 days*
Cation Exchange Capacity, Exchangeable Cations	G	50	Cool to less than 6°C	28 days NEPM 2013
Chloride, Bromide, Nitrate, Sulfate (1:5 aqueous extract)	G	10	Cool to less than 6°C	28 days NEPM 2013
Cyanide, Total (2)	G	20	Cool to less than 6°C	14 days NEPM 2013
Dioxins/Furans/DL-PCBs/PBDEs	G	50	Cool to less than 6°C	12 months
Explosives	G	50	Cool to less than 6°C	14 days*
Foreign Materials (RMS NSW Method T276)	P	6000	None, separate sample required	14 days
Iodide	G	20	Cool to less than 6°C	28 days
Metals (except Mercury or Chromium VI)	G	20	Cool to less than 6°C	6 months NEPM 2013
Mercury or Chromium VI	G	20	Cool to less than 6°C	28 days NEPM 2013
Micro (E. Coli, FC, TC etc.)	P (sterile)	125	Cool to less than 6°C	48 hours
Moisture	G	20	Cool to less than 6°C	14 days NEPM 2013
pH	G	20	Cool to less than 6°C	24hours recommended NEPM 2013 7 days allowed NEPM 2013
EC	G	20	Cool to less than 6°C	7 days NEPM 2013
Phenols (Totals or Speciated)	G	20	Cool to less than 6°C	14 days*
Phenoxy Acid Herbicides	G	20	Cool to less than 6°C	14 days*
Semi-Volatile Organic Compounds (SVOC)	G	50	Cool to less than 6°C	14 days NEPM 2013
PCBs (Dioxin-like PCBs, Aroclor, Congener group)	G	50	Cool to less than 6°C	28 days NEPM 2013
Per- and Polyfluoroalkyl Substances (PFAS)	P	10	Cool to less than 6°C, no teflon liner	14 days, extracts within 28 days
Total Fluoride	G	20	Cool to less than 6°C	28 days
Total Organic Carbon	G	20	Cool to less than 6°C	28 days
TRH (>C6-C10) plus BTEX	G	20	Cool to less than 6°C, Zero Headspace	14 days*
Volatile Organic Compounds (VOC) except Vinyl Chloride, Styrene or 2-Chloroethyl Vinyl Ether	G	20	Cool to less than 6°C, Zero Headspace	14 days NEPM 2013
Vinyl Chloride, Styrene or 2-Chloroethyl Vinyl Ether	G	20	Cool to less than 6°C, Zero Headspace	7 days NEPM 2013
TPH/TRH (>C10-C40)	G	20	Cool to less than 6°C, Zero Headspace	14 days*
VOCs / VHCs / VACs / THMs	G	20	Cool to less than 6°C, Zero Headspace	14 days*
Trip Spikes/Blanks for C6-C10/BTEX (prepared in the Lab)	G	full jar	**<-10°C**, Zero Headspace	14 days***
Biota (Per- and Polyfluoroalkyl Substances (PFAS))				
Fish (fillets, whole)	P	10	Freeze	14 days, extracts within 28 days
Crustacea (whole, white flesh, hepatopancreas)	P	10	Freeze	14 days, extracts within 28 days
Shell fish (whole, edible flesh)	P	10	Freeze	14 days, extracts within 28 days
Meat [Bovine, Ovine, Porcine] (liver, kidney & tissue)	P	10	Cool to less than 6°C	14 days, extracts within 28 days
Meat [Cervine, Leporine, Caprine] (liver, kidney & tissue)	P	50	Cool to less than 6°C	14 days, extracts within 28 days
Milk [Bovine, Ovine, Caprine]	P	500 mL	Cool to less than 6°C. Do not freeze	14 days, extracts within 28 days
Cheese [Bovine, Ovine, Caprine]	P	250	Cool to less than 6°C. Do not freeze	14 days, extracts within 28 days
Eggs (Chicken - white, yolk, whole)	P	6 each	Cool to less than 6°C. Do not freeze	14 days, extracts within 28 days
Vegetables (Lettuce, Cabbage,	P	250	Cool to less than 6°C. Do not freeze	14 days, extracts within 28 days
Fruit (Avocado, Tomato, Olive, Mango)	P	250	Cool to less than 6°C. Do not freeze	14 days, extracts within 28 days
Crops (Sorghum, Wheat, Corn, Canola)	P	250	Cool to less than 6°C. Do not freeze	14 days, extracts within 28 days
Serum - BD Vacutainer®	P	2x per sample	Cool to less than 6°C. Freeze	14 days, extracts within 28 days
Air				
Summa Canister	T	1L, 6L	Room Temperature	30 days
Low Uptake Waterloo Membrane Samplers (LU-WMS™)	T	1	Room Temperature, Cool to less than 6°C	30 days, extracts within 28 days
US EPA Method 325B Passive Sampler	T	1	Room Temperature, Cool to less than 6°C	30 days
Radiello® Passive Sampler RAD130	T	1	Room Temperature, Cool to less than 6°C	30 days, extracts within 28 days
Radiello® Passive Sampler RAD145	T	1	Room Temperature, Cool to less than 6°C	30 days
Radiello® Passive Sampler RAD168	T	1	Cool to less than 6°C	14 days
Radiello® Passive Sampler RAD170	T	1	Cool to less than 6°C	14 days
Typical sample weights contained in standard jars (zero headspace)			**250 mL jar** = 350-420 g	
Dust Gauges - contact Lab				

REFERENCES: US EPA SW846, NEPM, EPA VIC, ISO5667, Queensland Acid Sulfate Soils Management Advisory Committee (QASSMAC), US EPA Method 821
Please note Maximum THT's may vary upon the guideline document referenced.

NOTES:
(1) We recommend that you provide additional sample on the 1st, 11th, 21st. 31st etc sample for performance of Duplicates / Matrix Spikes. Note however that Matrix Spike determinations are not appropriate for all tests.
(2) Soil samples for cyanide analysis (in cores or jars) must be wrapped in dark plastic and kept cool at < 6°C without further treatment.
* Extract within 14 days and analyse within 40 days (Eurofins | mgt's preference is to extract within 7 days for volatiles where sufficient time available).
** Eurofins | mgt's preference is to analyse as soon as possible
*** Shelf life in matrix (sand) is low if not frozen, therefore freeze if storing or return to lab with samples immediately
# where acidity (hence liming rates) is captured in actual and potential acidity, analysis within one week should be satisfactory. Samples can be dried at 80°C to extend holding time
except Metals/OCPs/PCBs 28 days

CONTAINERS:
P = Plastic (HDPE or equivalent, NO teflon lined lid)
G = Glass (teflon lined lid)
T = Tube

Soil Samples are discarded two months from the date received unless otherwise arranged.

Eurofins | Environment Testing - APAC Contact Details

LOCATION	DELIVERY ADDRESS	TELEPHONE	E-MAIL	MOBILE NUMBERS
Adelaide	9 Main Terrace, Richmond SA 5033, AUSTRALIA	+61 8 8154 3100	EnviroSampleSA@eurofins.com	+61 409 801 765
Brisbane	Unit 1, 21 Smallwood Place, Murarrie QLD 4172, AUSTRALIA	+61 7 3902 4600	EnviroSampleQLD@eurofins.com	-
Darwin	Unit 3, 83 Coonawarra Road, Winellie NT 0820, AUSTRALIA	+61 8 8154 3103	EnviroSampleDRW@eurofins.com	+ 61 428 489 614
Melbourne	6 Monterey Road, Dandenong South VIC 3175, AUSTRALIA	+61 3 8564 5000	EnviroSampleVic@eurofins.com	-
Newcastle	Unit 7, 7 Friesian Close, Sandgate, NSW 2304, AUSTRALIA	+61 2 9900 8490	EnviroSampleNTL@eurofins.com	+61 410 220 750
Perth	Unit 2, 91 Leach Hwy, Kewdale WA 6105, AUSTRALIA	+61 8 9251 9600	EnviroSampleWA@eurofins.com	-
Sydney	Unit F3, Lane Cove Business Park, 16 Mars Road. Lane Cove NSW 2066, AUSTRALIA	+61 2 9900 8400	EnviroSampleNSW@eurofins.com	-
Wollongong	Unit 16, 7 Investigator Drive, Unanderra NSW 2526, AUSTRALIA	+61 2 9900 8492	EnviroSampleWOLL@Eurofins.com	+61 447 584 487
Auckland	35 O'Rorke Road, Penrose, Auckland, Auckland 1061, NEW ZEALAND	+64 9 579 2669 X707	EnviroSampleAKL@eurofins.com	-
Christchurch	43 Detroit Drive, Rolleston, Christchurch, 7675, NEW ZEALAND	+64 3 343 5227	EnviroSampleCHC@eurofins.com	+64 277 660 233

Recommended Preservation and Container Guide

Parameter	Container	Lab Analysis Portion mL[2]	Eurofins | mgt Preferred Preservation	Recommended Holding Times
Acidity/Alkalinity	P or G	200	6°C	14 days**
Alcohols	PT	2 x vials	pH<2 (HCl), 6°C, Zero headspace	14 days [3]
Ammonia-N	P or G	200	pH<2 (H_2SO_4), 6°C[1] /site filter and freeze	28 days
BOD_5	P or G	2 x 500	6°C, Zero headspace	48 Hours
Bromate	P	50	6°C	28 days
Bromide	P	50	6°C	28 days
BTEX plus TPH (>C6-C10)	PT	2 x vials	pH<2 (HCl or H_2SO_4), 6°C, Zero headspace	14 days [3]
Carbamates/Dioxins/Furans	G	500	6°C	1 month
Carbon, Total Organic (TOC)	G	100	pH<2 (H_2SO_4 or HCl), 6°C	28 days
Carbon, Dissolved Organic (DOC)	G	100	Field filter at 0.45µm then pH<2 (H_2SO_4 or HCl), 6°C	28 days
Cations	P	50	6°C, pH<2 (HNO_3)	6 months[APHA]
Chlorate	P	50	6°C	7 days
Chloride	P	50	6°C	28 days
Chlorite	P	50	6°C	24 hours[5]
Chlorine (residual)	-	--	Field test	Note (5)
Chlorophyll-a (Vol' PQL dependant)	Dark P	500-2000	Unfiltered Dark, 6°C or Filtered residue	24 Hours[##]
Chromium VI (hexavalent Cr)	P	100	filtered, unpreserved / pH 8-9 (NaOH), 6°C[1]	1 day / 28 days [1][APHA]
COD	G	100	pH<2 (H_2SO_4), 6°C[1]	28 days
Colour	P	100	6°C	2 days[AS]
Conductivity (EC) or Salinity	P	50	6°C, Zero headspace, 6oC	28 days
Cyanide (Total/Amenable)	P	100	pH >12 (NaOH), 6°C Dark	14 days [6]
Cyanide (Free / WAD)	P	100	Free neutral, WAD pH >12 (NaOH), 6oC Dark	14 days [6][##]
Dissolved Oxygen	-	--	Field test	Note (5)
Explosives	G	500	6°C	7 days*
Ferrous/Ferric Iron [4]	P	100	filtered pH <2 (HCl), 6°C, Dark, Zero Headspace	7 days[ISO]
Fluoride	P	50	6°C	28 days
Formaldehyde	G	100	6°C	7 days
Glyphosate & AMPA	G, PET	250	6°C - 0.008% $Na_2S_2O_3$[8]	14 days
Hardness	P	50	6°C, pH<2 (HNO_3)	6 months
Iodate	P	50	6°C	1 month
Iodide	P	50	6°C	1 month
Ion Balance	P	500-1000	See Individual Analytes in price book	--
Metals – Total (Recoverable)	P	100	pH<2 (HNO_3)	6 months
Metals – Dissolved	P	100	Field Filter at 0.45 µm **then** pH<2 (HNO_3)	6 months
Mercury – (Total Recoverable)	P	100	pH<2 (HNO_3)	28 days
Mercury – Dissolved	P	100	Field Filter at 0.45 µm **then** pH<2 (HNO_3)	28 days
Methane (Ethane/Ethene)	PT	2 x vials	pH<2 (HCl or H_2SO_4), 6°C, Zero headspace[7]	14 days
Nitrogen: TKN	P or G	100	pH<2 (H_2SO_4), 6°C[1]	28 days
Nitrate / NOx	P or G	50	unpreserve 6°C / pH<2 (H_2SO_4), 6°C	2 days[##] / 7 days
Nitrite	P or G	50	unpreserve 6°C	2 days
Nitrogen: Total N	-	--	TKN and NOx sample bottles are required	--
Oil & Grease	G	2 x 500	pH<2 (H_2SO_4 or HCl), 6°C	28 days
OC/OP Pesticides – see SVOCs	G	see SVOC	6°C	7 days*
PAHs – see SVOCs below	G	see SVOC	6°C	7 days*
PFOS/PFOA/Fluorotelomers	PET	250	6°C add 0.008% $Na_2S_2SO_3$[8]	14 days
pH / free CO2 / total CO_2	P or G	100	Field Test, 6°C	Note (5)
Phenolics (total)	P or G	100	pH<2 (H_2SO_4),6°C	28 days[APHA]
Phenols – speciated	G	see SVOC	6°C	7 days*
Phenoxy Acid Herbicides	G	500	6°C, pH 1-2 HCl	14 days
Phosphate (ortho)	P or G	50	6°C	2 days[##] 1 month filtered[ISO]
Phosphorus (Total filtered or unfiltered)	P	100	pH<2 (HNO_3)	1 month
Solids (suspended, dissolved etc)	P	500-1000	6°C	7 days
Sulphate	P	50	6°C	28 days
Sulphide (Total)	P	200	6°C (Zinc Acetate/NaOH pH>9) zero headspace	7 Days
Sulphide (Dissolved)	P	100	6°C	24 hours
Surfactants – anionic (MBAS)	G	250	6°C	2 days
SVOCs including – OCs, OPs, PCBs, PAHs, Phthalates (**normal level**) plus TPH (>C10-C40)	G	2 x 500	6°C	7 days*
Low or Trace level Organics		4 x 500		
SVOC's (USEPA 8270 list)	G	see SVOC	6°C	7 days*
TPH (>C6-C10)	PT	As for BTEX no additional vials needed	pH<2 (HCl), 6°C, Zero headspace	14 days [3]
TPH (>C10-C40)	G	As for SVOC 'normal' no additional needed	6°C	7 days*
Turbidity	P or G	100	Analyse Immediately, dark, 6°C	48 Hours
VOCs / VHCs / VACs / THMs / MTBEs ^	PT	2xvials	pH<2 (HCl or H_2SO_4), 6°C, Zero headspace[7]	14 days [3]
Microbiological	PET/S	120	6°C	24 hours
Micro' – (in Chlorinated Water) Coliforms - Ecoli	PET/S	500 (4*120)	6°C - 0.008% $Na_2S_2O_3$.	24 hours
Micro' – (in Chlorinated Water)	PET/S	120	6°C - 0.008% $Na_2S_2O_3$.	24 hours

REFERENCES: APHA 22nd Edition, USEPA SW846, ISO 5667.3, EPA VIC and AS/NZS 5667.1 1998 Please note Maximum HT's may vary upon the guideline document referenced.

NOTES:
(1) This test may not require preservation if received and analysed within 24 hours of sampling; this must be pre-arranged with the laboratory.
(2) We recommend that you provide additional sample on the 1st, 11th, 21st, 31st etc sample for performance of Duplicates / Matrix Spikes. (Note however that Matrix spike are not appropriate for all tests).
(3) USEPA recommends 14 days, Australian Standard recommends 7 days.
(4) If **Dissolved Metals** are requested, the Ferrous Iron sample must be field filtered before being preserved
(5) This analyte should be determined in the field, these tests will not be measured for compliance to holding time but are analysed on receipt
(6) Holding Time is reduced to 24hrs with the presence of sulphides. Contact the laboratory if the presence of sulphides is suspected
(7) Sodium Bisulfate is an alternative preservation for VOC analysis upon request
(8) If residual chlorine is present then add 0.008% $Na_2S_2O_3$
* This holding time requires the samples to be extracted within 7 days and analysed within 40 days.
** The Eurofins | mgt aim is to perform these analyses within 2 days (where sufficient time available).
The holding times may be extended to 28 days if the sample is filtered then frozen.
^ Excepting vinyl chloride, styrene or 2-chloroethyl vinyl ether, for which the holding time is 7 days with the same preservation

CONTAINERS:
P = Plastic (HDPE or equivalent, all teflon lined), batch tested
PT = Purge & Trap VOA Vial (with teflon liner), batch tested
PET = Plastic (polyterephthalate), batch tested
PP = Plastic (polypropylene, no Teflon), batch tested
G = Glass (all teflon lined), batch tested
P/S = Plastic Sterile, batch tested

Liquid samples are discarded 4 weeks from the date received

ANALYTICAL METHOD SUMMARIES

Analyte	Method	Reference Method
Organics		
1,4-Dioxane*	A water sample that has been dechlorinated and preserved with a microbial inhibitor is fortified with the isotopically labelled SUR, 1,4-dioxane-d8. The sample is extracted by one of two SPE options. In option 1, a 500-mL sample is passed through an SPE cartridge containing 2 g of coconut charcoal to extract the method analyte and SUR. In option 2, a 100-mL sample is extracted on a Waters AC-2 Sep-Pak or Supelco Supelclean ENVI-Carb Plus cartridge. In either option, the compounds are eluted from the solid phase with a small amount of dichloromethane (DCM), approximately 9 mL or 1.5 mL, respectively. The extract volume is adjusted, and the IS, tetrahydrofuran-d8 (THF-d8), is added. Finally, the extract is dried with anhydrous sodium sulfate. Analysis of the extract is performed by GC/MS. The data provided in this method were collected using splitless injection with a high-resolution fused silica capillary GC column that was interfaced to an MS operated in the SIM mode. The analyte, SUR and IS are separated and identified by comparing the acquired mass spectra and retention times to reference spectra and retention times for calibration standards acquired under identical GC/MS conditions. The concentration of the analyte is determined by comparison to its response in calibration standards relative to the IS.	**US EPA Method 522 DETERMINATION OF 1,4-DIOXANE IN DRINKING WATER BY SOLID PHASE EXTRACTION (SPE) AND GAS CHROMATOGRAPHY MASS SPECTROMETRY (GC/MS) WITH SELECTED ION MONITORING (SIM): EPA/600/R-08/101**
Methamphetamine in Swabs	**TARGET ANALYTES**: • Ephedrine • Pseudoephedrine • Amphetamine • Methamphetamine • MDA • MDMA SAMPLING: 1. Using a new pair of nitrile gloves, remove the wipe from its protective package that is contained in the supplied kit. NOTE: Do not use vinyl gloves due to the potential for leaching of phthalate	**NIOSH Method 9111 - METHAMPHETAMINE on Wipes by Liquid Chromatography/Mass Spectrometry**

Analyte	Method	Reference Method
	plasticisers and contamination of the samples. 2. Place the supplied 10 cm x 10 cm template over the area to be sampled (may tape in place along outside edge of template). Wipe the surface to be sampled with firm pressure, using vertical S-strokes. Fold the exposed side of the pad in and wipe the area with horizontal S-strokes. Fold the pad once more and wipe the area again with vertical S-strokes. 3. Fold the pad, exposed side in, and place in supplied shipping container and seal with cap. NOTE: Keep samples refrigerated (<6 ºC). While nicotine and related compounds are stable on the recommended wipe media for at least 7 days at room temperature, refrigeration is recommended as soon as possible. 4. Clean the template before use for the next sample or use a new disposable template. 5. Label each sample clearly with a unique sample identifier. 6. Prepare a minimum of two field blanks with one field blank for every ten samples. SAMPLE PREPARATION: 7. Desorption from media: a. Remove cap from shipping container. Sample media should fit loosely in the container. If not, rearrange media carefully with rinsed forceps or transfer to a larger container. If the sample media are transferred to a larger container, do not discard the original container. Samples may consist of more than one wipe. If this is the case, internal standard and desorption solution volumes may be adjusted accordingly. b. Spike exactly 50 µL of internal standard spiking solution onto each wipe sample. c. Add 30 mL desorption solution. If the samples were transferred to a larger container, the original shipping container must be rinsed with the desorption solution first, shaken, and the rinsate decanted into the larger container. d. Cap securely and mix contents by inverting the tubes end over end on a rotary mixer at 10-30 rpm for at least one hour. NOTE 1: The desorption solution must percolate freely through the gauze wipes.	

Analyte	Method	Reference Method
	e. Filter an aliquot of the sample through a 0.45 µm membrane. 8. Transfer the filtered sample into a vial and cap. 9. Analyse samples, standards, blanks, and Quality Control samples (QCs) by LC-MS/MS or LC-QToF-MS using in-house method LTM-ORG-2240.	
Methane in Water	The measurement of dissolved gases such as methane, ethane, and ethylene in ground water is important in determining whether intrinsic bioremediation is occurring in a fuel- or solvent contaminated aquifer. A helium headspace is generated above a water-filled bottle. Gases that are dissolved in the water partition between the gas and liquid phases and equilibrate rapidly. An aliquot of this headspace is analysed by gas chromatography to determine the gases' concentration in this phase. The concentration of the gas dissolved in the water can then be calculated based on its partitioning properties, as indicated by its Henry's Law constant using in-house LTM-ORG-2070	**Analysis of Dissolved Methane, Ethane, and Ethylene in Ground Water by a Standard Gas Chromatographic Technique., Don H. Kampbell* and Steve A. Vandegrift., U.S. Environmental Protection Agency, Journal of Chromatographic Science, Vol. 36, May 1998**
Per- and Polyfluoroalkyl Substances (PFAS) in Water	A water sample is fortified with isotopically labelled surrogates and passed through an IXR solid phase extraction (SPE) cartridge to extract the method analytes and surrogates. The compounds are eluted from the solid phase with a small amount of methanol with modifier. The extract is concentrated to near dryness under reduced pressure in an automated system and then adjusted to a final volume with mobile phase after adding the injection standards IS(s). An injection is made into an LC equipped with a C18 column that is interfaced to a tandem mass spectrometer (MS/MS) operating in scheduled MRM mode. The analytes are separated and identified by comparing the acquired mass spectra and retention times to reference spectra and retention times for calibration standards acquired under identical LC-MS/MS conditions. The concentration of each analyte is determined by using the isotope dilution technique. Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available – see Table below. Labelled compounds are enriched with deuterium to produce ^{2}H-labeled analogues, stable isotopes of oxygen-18 to	**US EPA Method 533: Determination of Per- And Polyfluoroalkyl Substances in Drinking Water by Isotope Dilution Anion Exchange Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry., November 2019** **US EPA Method 537.1 Determination of Selected Per- and Polyfluorinated Alkyl Substances in Drinking Water by Solid Phase Extraction And Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)** **Version 1.0, November 2018**

Analyte	Method	Reference Method
	produce ^{18}O -labelled analogues or carbon-13 to produce ^{13}C-labeled analogues. The labelled analogues are spiked into each sample to allow identification and correction of the concentration of the native compounds in the extraction, clean-up and the analytical process. Correction of reported results along with a statement of the recovery for labelled analogues are included in the certificate of analysis. Typical recoveries are between 50-150% (± 50%) depending on media and the specific analyte. An initial calibration is prepared for each native compound. Internal standard calibration is applied to the determination of the native compounds that do not have exact labelled analogues and that are not being quantified by isotope dilution. The recoveries of the labelled analogues themselves are determined by internal standard quantitation (ISTD) and used as a quality control check on the overall analytical process. Branched and linear isomers are used for calibration standards when they are commercially available as a certified standard. Table 2 lists standards that are currently commercially available and used. The target analyte response for analytes containing branched and linear isomer result from the summation of peaks from all isomers. Limit of reporting is listed in Table 3: PFAS LORs - Water, Soil/Sediments & Biotic Matrices. The LOR obtainable is dependent on the matrix and method. The limit of reporting may be affected by the presence of other contaminants or components in individual samples that cause analytical interferences that raise the achievable LOR. This problem is more likely to occur in complex matrices such as soil, waste, biosolids and biota samples.	**US EPA Method 8327 - Per- and polyfluoroalkyl substances (PFAS) using external standard calibration and multiple reaction monitoring (MRM) liquid chromatography/tandem mass spectrometry (LC/MS/MS)** **United States of America's Department of Defense (DoD) Environmental Data Quality Workgroup (EDQW) and the Department of Energy (DOE) Consolidated Audit Program (DOECAP) Operations Team developed the Quality Systems Manual (QSM) for Environmental Laboratories. Version 5.3 May 2019** **UNITED STATES DEPARTMENT OF DEFENSE** **Data Validation Guidelines Module 3: Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by QSM Table B-15** **Environmental Data Quality Workgroup** **1 May 2020**
Per- and Polyfluoroalkyl Substances (PFAS) in Soils	The sample is homogenised, spiked with isotopically labelled surrogates solution and digested with 1M NaOH by heating and ultrasonic agitation, followed by incubation. Samples are neutralised with	**USEPA Method EPA-821-R-11-007 Draft Procedure for Analysis of Perfluorinated Carboxylic Acids and Sulfonic Acids**

Analyte	Method	Reference Method
	HCl and extracted with solvent. Solvent extraction and clean-up is then performed using 50:50/ACN:MeOH (v/v) and then cleaned up using a carbon solid-phase extraction (SPE) cartridge. An injection is made into an LC equipped with a C18 column that is interfaced to a tandem mass spectrometer (MS/MS). The analytes are separated and identified by comparing the acquired mass spectra and retention times to reference spectra and retention times for calibration standards acquired under identical LC-MS/MS conditions. The concentration of each analyte is determined by using the isotope dilution technique. Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available – see Table below. Labelled compounds are enriched with deuterium to produce ^{2}H-labeled analogues, stable isotopes of oxygen-18 to produce ^{18}O - labelled analogues or carbon-13 to produce ^{13}C-labeled analogues. The labelled analogues are spiked into each sample to allow identification and correction of the concentration of the native compounds in the extraction, clean-up and the analytical process. Correction of reported results along with a statement of the recovery for labelled analogues are included in the certificate of analysis. Typical recoveries are between 50-150% (± 50%) depending on media and the specific analyte. An initial calibration is prepared for each native compound. Internal standard calibration is applied to the determination of the native compounds that do not have exact labelled analogues and that are not being quantified by isotope dilution. The recoveries of the labelled analogues themselves are determined by internal standard quantitation (ISTD) and used as a quality control check on the overall analytical process. Branched and linear isomers are used for calibration standards when they are commercially available as a certified standard. Table 2 lists standards that are currently commercially available and used. The target analyte response for analytes	**in Sewage Sludge and Biosolids by HPLC/MS/MS December 2011** **US EPA Method 8327 - Per- and polyfluoroalkyl substances (PFAS) using external standard calibration and multiple reaction monitoring (MRM) liquid chromatography/tandem mass spectrometry (LC/MS/MS)** **USEPA Method 533: Determination of Per- And Polyfluoroalkyl Substances in Drinking Water by Isotope Dilution Anion Exchange Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry., November 2019** **United States of America's Department of Defense (DoD) Environmental Data Quality Workgroup (EDQW) and the Department of Energy (DOE) Consolidated Audit Program (DOECAP) Operations Team developed the Quality Systems Manual (QSM) for Environmental Laboratories. Version 5.3 May 2019** **UNITED STATES DEPARTMENT OF DEFENSE**

Analyte	Method	Reference Method
	containing branched and linear isomer result from the summation of peaks from all isomers. Limit of reporting is listed in Table 3: PFAS LORs - Water, Soil/Sediments & Biotic Matrices. The LOR obtainable is dependent on the matrix and method. The limit of reporting may be affected by the presence of other contaminants or components in individual samples that cause analytical interferences that raise the achievable LOR. This problem is more likely to occur in complex matrices such as soil, waste, biosolids and biota samples.	**Data Validation Guidelines Module 3: Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by QSM Table B-15** **Environmental Data Quality Workgroup** **1 May 2020**
Per- and Polyfluoroalkyl Substances (PFAS) in Biotic Matrices	The sample is cryogenically milled with dry ice, a homogenate taken and spiked with isotopically labelled surrogates solution. The sample is sonicated and vortexed and then neutralised with HCl before adding acetonitrile and again sonicated and vortexed before QuEChERS extraction is undertaken. Depending on the particular biotic matrix ENVI-carb SPE may be utilised prior to mixed-mode reversed phase WAX SPE was used before concentration to a known volume. An injection is made into an LC equipped with a C18 column that is interfaced to a tandem mass spectrometer (MS/MS). The analytes are separated and identified by comparing the acquired mass spectra and retention times to reference spectra and retention times for calibration standards acquired under identical LC-MS/MS conditions. The concentration of each analyte is determined by using the isotope dilution technique. Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available – see Table below. Labelled compounds are enriched with deuterium to produce 2H-labeled analogues, stable isotopes of oxygen-18 to produce 18O - labelled analogues or carbon-13 to produce 13C-labeled analogues. The labelled analogues are spiked into each sample to allow identification and correction of the concentration of the native compounds in the extraction, clean-up and the analytical process. Correction	**US EPA Method 8327 - Per- and polyfluoroalkyl substances (PFAS) using external standard calibration and multiple reaction monitoring (MRM) liquid chromatography/tandem mass spectrometry (LC/MS/MS)** **USEPA Method 533: Determination of Per- And Polyfluoroalkyl Substances in Drinking Water by Isotope Dilution Anion Exchange Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry., November 2019** **United States of America's Department of Defense (DoD) Environmental Data Quality Workgroup (EDQW) and the Department of Energy (DOE) Consolidated Audit Program (DOECAP) Operations Team**

Analyte	Method	Reference Method
	of report results along with a statement of the recovery for labelled analogues are included in the certificate of analysis. Typical recoveries are between 50-150% (± 50%) depending on media and the specific analyte. An initial calibration is prepared for each native compound. Internal standard calibration is applied to the determination of the native compounds that do not have exact labelled analogues and that are not being quantified by isotope dilution. The recoveries of the labelled analogues themselves are determined by internal standard quantitation (ISTD) and used as a quality control check on the overall analytical process. Branched and linear isomers are used for calibration standards when they are commercially available as a certified standard. Table 2 lists standards that are currently commercially available and used. The target analyte response for analytes containing branched and linear isomer result from the summation of peaks from all isomers. Limit of reporting is listed in Table 3: PFAS LORs - Water, Soil/Sediments & Biotic Matrices. The LOR obtainable is dependent on the matrix and method. The limit of reporting may be affected by the presence of other contaminants or components in individual samples that cause analytical interferences that raise the achievable LOR. This problem is more likely to occur in complex matrices such as soil, waste, biosolids and biota samples.	**developed the Quality Systems Manual (QSM) for Environmental Laboratories. Version 5.3 May 2019** **UNITED STATES DEPARTMENT OF DEFENSE** **Data Validation Guidelines Module 3: Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by QSM Table B-15** **Environmental Data Quality Workgroup** **1 May 2020**
Total Oxidisable Precursor Analysis (TOPA) - Screen	Samples are treated via hydroxyl radical oxidation using an activated agent with overnight heating which converts the masked fluorinated precursors to their equivalent detectable perfluoroalkyl carboxylic acids (PFCAs) and perfluoroalkyl sulfonates (PFSAs). LC-MS/MS is done before and after TOP Analysis.	**Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff, Erika F. Houtz and David L. Sedlak, Environ. Sci. Technol. 2012**

Analyte	Method	Reference Method
Total Oxidisable Precursor Analysis (TOPA) – Detailed	Detailed TOPA includes multiple mass-labelled analogues added prior to the "cooking" step and the recoveries provided along with dilutions required are reported in the certificate of analysis. Sum of all PFAS are reported pre- and post TOPA along with. Results for total PFAS concentration post-TOPA should be greater or equal to the total PFAS concentration pre-TOPA, (signifies no material losses observed in preparation steps, noting a decrease of up to 10% might be expected due to normal analytical variability). – the sum of PFCA post-TOPA should be equal to or greater than the sum of PFCA pre-TOPA, which signifies any precursors being converted to PFCA products. – the sum of PFSA post-TOPA should approximate the sum of PFSA pre-TOPA, signifying that precursors did not convert to PFSA products. – for a full oxidation, no PFAA precursors (e.g. 6:2 FTS, FOSA) are detectable post oxidation, signifying complete oxidation. – for situations where a near complete oxidation is acceptable, minimal PFAA precursors are detectable post oxidation signified by: • for aqueous samples, sum of [PFAA precursors] divided by sum of [Total PFAS] <5%. • for soil samples, sum of [PFAA precursors] divided by sum of [Total PFAS] <10%. • noting greater leniency may be applied for samples where PFAS were detected ≤ 10 times LOR.	**PFAS National Environmental Management Plan JANUARY 2020**

Analyte	Method	Reference Method

Table 1: Per- and Polyfluoroalkyl Substances (PFAS)

Native PFASs Perfluoroalkyl carboxylic acids (PFCAs)	Extracted Internal Standard Analytes (EIS) Isotope Dilution Quantification Standard
Perfluorobutanoic acid (PFBA)	Perfluoro-n-[1,2,3,4-$^{13}C_4$]butanoic acid
Perfluoropentanoic acid (PFPeA)	Perfluoro-n-[1,2,3,4,5-$^{13}C_5$]pentanoic acid
Perfluorohexanoic acid (PFHxA)	Perfluoro-n-[1,2,3,4,5-$^{13}C_5$]hexanoic acid
Perfluoroheptanoic acid (PFHpA)	Perfluoro-n-[1,2,3,4-$^{13}C_4$]heptanoic acid
Perfluorooctanoic acid (PFOA)	Perfluoro-n-[1,2,3,4,5,6,7,8-$^{13}C_8$]octanoic acid
Perfluorononanoic acid (PFNA)	Perfluoro-n-[1,2,3,4,5-$^{13}C_5$]nonanoic acid
Perfluorodecanoic acid (PFDA)	Perfluoro-n-[1,2,3,4,5,6-$^{13}C_6$]decanoic acid
Perfluoroundecanoic acid (PFUnA)	Perfluoro-n-[1,2-$^{13}C_2$]undecanoic acid
Perfluorododecanoic acid (PFDoA)	Perfluoro-n-[1,2-$^{13}C_2$]dodecanoic acid
Perfluorotridecanoic acid (PFTrDA)	Perfluoro-n-[1,2-$^{13}C_2$]tetradecanoic acid ISTD
Perfluorotetradecanoic acid (PFTeDA)	Perfluoro-n-[1,2-$^{13}C_2$]tetradecanoic acid
Perfluoroalkane sulfonic acids (PFSAs)	
Perfluoropropanesulfonic acid (PFPrS)	Sodium perfluoro-n-[2,3,4-$^{13}C_3$]butane sulfonate ISTD
Perfluorobutanesulfonic acid (PFBS)	Sodium perfluoro-n-[2,3,4-$^{13}C_3$]butane sulfonate
Perfluoropentane sulfonic acid (PFPeS)	Perfluoro-n-[1,2,3,4-$^{13}C_4$]octane sulfonic acid ISTD
Perfluorohexane sulfonate (PFHxS)	Sodium perfluoro-n-[$^{18}O_2$]hexanesulfonate
Potassium perfluorohexanesulfonate (linear and branched isomers) (br-PFHxSK)	Sodium perfluoro-n-[$^{18}O_2$]hexanesulfonate
Perfluoroheptane sulfonate (PFHpS)	Perfluoro-n-[1,2,3,4-$^{13}C_4$]octane sulfonic acid
Perfluorooctane sulfonate (PFOS)	Perfluoro-n-[1,2,3,4,5,6,7,8-$^{13}C_8$]octane sulfonate
Potassium perfluorooctanesulfonate (linear and branched isomers) (br-PFOSK)	Perfluoro-n-[1,2,3,4,5,6,7,8-$^{13}C_8$]octane sulfonate
Perfluorononanesulfonic acid (PFNS)	Perfluoro-n-[1,2,3,4-$^{13}C_4$]octane sulfonic acid ISTD
Perfluorodecanesulfonic acid (PFDS)	Perfluoro-n-[1,2,3,4-$^{13}C_4$]octane sulfonic acid ISTD
Perfluoroalkane sulfonamides (FASAs), Perfluoroalkane sulfonamido ethanols (FASEs) and N-alkyl perfluoroalkane sulfonamido ethanols (MeFASEs, EtFASEs) Perfluoroalkane sulfonamido acetic acids (FASAAs) and N-alkyl perfluoroalkane sulfonamido acetic acids (MeFASAAs, EtFASAAs)	
Perfluorooctane sulfonamide (FOSA)	Perfluoro-n-[1,2,3,4,5,6,7,8-$^{13}C_8$]octane sulfonamide
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	N-methyl-d_3-perfluoro-n-octanesulfonamide
N-ethylperfluoro-1-octanesulfonamide (N-EtFOSA)	N-ethyl-d_5-perfluoro-n-octanesulfonamide
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	2-(N-methyl-d_3-perfluoro-1-octane sulfonamido)-ethanol-d_4
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	2-(N-ethyl-d_5-perfluoro-1-octane sulfonamido)-ethanol-d_4
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	N-ethyl-d_5-perfluoro-n-octanesulfonamidoacetic acid
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MEFOSAA)	N-methyl-d_3-perfluoro-1-octanesulfonamidoacetic acid
Fluorotelomers **n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)**	
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2 FTSA)	Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-$^{13}C_2$]hexane sulfonate (4:2 FTSA)
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2 FTSA)	Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-$^{13}C_2$]octane sulfonate (6:2 FTSA)
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2 FTSA)	Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-$^{13}C_2$]decane sulfonate (8:2 FTSA)
1H, 1H, 2H, 2H-perfluorododecane sulfonic Acid (10:2 FTSA)	Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-$^{13}C_2$, D4]dodecane sulfonate (10:2 FTSA)
Additional PFAS Compounds	
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX)	$^{13}C_3$-Hexafluoropropylene oxide dimer acid ($^{13}C_3$-HFPO-DA)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) [11Cl-F53B]	Perfluoro-n-[1,2,3,4,5,6,7,8-$^{13}C_8$]octane sulfonate
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS) [9Cl-F53B]	Perfluoro-n-[1,2,3,4,5,6,7,8-$^{13}C_8$]octane sulfonate ISTD
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	Perfluoro-n-[1,2,3,4,5,6,7,8-$^{13}C_8$]octanoic acid ISTD
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	Perfluoro-n-[1,2,3,4-$^{13}C_4$]heptanoic acid ISTD
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	Sodium perfluoro-n-[2,3,4-$^{13}C_3$]butane sulfonate ISTD
Perfluoro-3-methoxypropanoic acid (PFMPA)	Perfluoro-n-[1,2,3,4-$^{13}C_4$]butanoic acid ISTD
Perfluoro-4-methoxybutanoic acid (PFMBA)	Perfluoro-n-[1,2,3,4,5-$^{13}C_5$]pentanoic acid ISTD
6:2 fluorotelomer sulfonamide alkylbetaine (6:2 FTAB)	N-ethyl-d_5-perfluoro-n-octanesulfonamide ISTD
3:3 Fluorotelomercarboxylic acid (3:3 FTCA)	Perfluoro-n-[1,2,3,4,5,6,7,8-$^{13}C_8$]octanoic acid ISTD
5:3 Fluorotelomer carboxylic acid (5:3 FTCA)	Perfluoro-n-[1,2,3,4,5,6,7,8-$^{13}C_8$]octanoic acid ISTD
Perfluoroethylcyclohexane sulfonate (PFECHS)	Perfluoro-n-[1,2,3,4-$^{13}C_4$]octane sulfonic acid ISTD

Analyte	Method	Reference Method
	Table 2: Currently Available Certified PFAS Standards Containing Branched and Linear Isomers Perfluorohexanesulfonic acid (PFHxS) Perfluorooctanesulfonic acid (PFOS) 2-(N-methylperfluorooctanesulfonamido) acetic acid (NMeFOSAA) 2-(N-ethylperfluorooctanesulfonamido) acetic acid (NEtFOSAA)	
Adsorbable Organofluorine (AOF)	For the trace level determination of adsorbable organic fluorine (AOF) in water, the sample must first be passed through a mixed-mode weak anion exchange solid-phase extraction (SPE) cartridge thereby adsorbing the PFAS compounds. AOF is then determined by eluting the contents of the SPE cartridge with NaOH in methanol, evaporating and reconstituting the extract, and finally determining the fluoride content of the extract by CIC. The LOR is dependent on the volume passed through the SPE, so the presence of suspended solids does impose limits on the procedure, but for clean waters the LOR is 0.001 mg F/L. Where significant levels of suspended solids are encountered the LOR may be limited to 0.01 mg F/L and the suspended solids may be determined separately by direct combustion.	**ASTM D7359-18 ASTM D7359 Standard Test Method for Total Fluorine, Chlorine and Sulfur in Aromatic Hydrocarbons and Their Mixtures by Oxidative Pyrohydrolytic Combustion followed by Ion Chromatography Detection (Combustion Ion Chromatography-CIC).**
Extractable Organofluorine (EOF)	For solid samples, where LORs lower than the direct combustion method of 0.05 mg F/kg are required, extraction can be performed using the same solvent systems used for conventional targeted LC-MS/MS methods. The resulting concentrate is then combusted giving an extractable organofluorine result. A LOR of 0.02 mg F/kg is achievable.	**ASTM D7359-18 Standard Test Method for Total Fluorine, Chlorine and Sulfur in Aromatic Hydrocarbons and Their Mixtures by Oxidative Pyrohydrolytic Combustion followed by Ion Chromatography Detection (Combustion Ion Chromatography-CIC).**
TRH (Volatile)/BTEX **C6-C10 – 2013 NEPM Fractions** **C6-C9 – 1999 NEPM Fractions**	10g soil extracted with 20mL methanol, tumbled for 1 hour, and analysed with solvent and instrument check surrogates. Clay samples must be completely disintegrated before an aliquot is taken for analysis. Water direct injection of supplied sample (unopened) and analysis with solvent and instrument check surrogates. Analysis by capillary column Purge and Trap GCMS (Eurofins in-house method numbers: Total Recoverable	**USEPA Method 8260D** **NEPM 2013 Schedule B3 Appendix 1: Determination of total recoverable hydrocarbons (TRH) in soil**

Analyte	Method	Reference Method
	Hydrocarbons (TPH), Method: LTM-ORG-2010, Method: LTM-GEN-7080 Moisture). Owing to the differential responses of mass spectrometric detectors towards aliphatic and aromatic compounds, it is essential that the standard contain representatives of both groups. This standard should therefore consist of about 40% aromatic and 60% aliphatic target analytes, to be representative of a typical Australian fuel. The aromatic compounds shall comprise the components of BTEX. The aliphatics shall comprise equal proportions of all n-alkanes in the C6 to C10 range.	
Total Recoverable Hydrocarbons C10-C36 – 1999 NEPM Fractions **>C10-C40 – 2013 NEPM Fractions**	Soil - 10g soil and anhydrous sodium sulfate extracted with 20mL dichloromethane/acetone (1:1), and tumbled for a minimum of 1 hour. Clay samples must be completely disintegrated before an aliquot is taken for analysis. Water - One 250ml of water sequentially extracted in a separatory funnel three times with 20mL dichloromethane. Analysis by capillary column GC/FID (Eurofins in-house method numbers: Total Recoverable Hydrocarbons (TRH), Method: LTM-ORG-2010, Method: LTM-GEN-7080 Moisture)	**USEPA Method 8015C** **NEPM 2013 Schedule B3 Appendix 1: Determination of total recoverable hydrocarbons (TRH) in soil**
TRH (Silica Gel)	Sample extracts obtained from the appropriate TRH method are exchanged to a non-polar solvent and are passed through a column containing 1 gram of 100% activated silica gel. Elution is achieved with a small volume of 1:1 DCM:pentane or 1:1 DCM:hexane. The eluted solvent is then concentrated and analysed by the appropriate TRH analysis procedure. A decanoic acid reverse surrogate is used to provide assurance of the effectiveness of the silica-gel clean-up.	**USEPA Method 3630C** **NEPM Appendix 1: Determination of total recoverable hydrocarbons (TRH) in soil**
VOCs	10g soil extracted with 20mL methanol, tumbled for 1 hour, and analysed with solvent and instrument check surrogates. Clay samples must be completely disintegrated before an aliquot is taken for analysis. Water direct injection of supplied sample (unopened) and analysis with solvent and instrument check surrogates. Analysis by capillary column Purge and Trap GC-MS (Eurofins in-house method numbers	**US EPA Method 8260D**

Analyte	Method	Reference Method
	Method: LTM-ORG-2150, LTM-ORG-2160, Method: LTM-GEN-7080 Moisture).	
Semi-volatile Organic Compounds (SVOCs)	The samples are prepared for analysis by gas chromatography/mass spectrometry (GC/MS) using the appropriate sample preparation (refer to Method 3500) and, if necessary, sample clean-up procedures (refer to Method 3600). The semi-volatile compounds are introduced into the GC/MS by injecting the sample extract into a gas chromatograph (GC) with a narrow-bore fused-silica capillary column. The GC column is temperature-programmed to separate the analytes, which are then detected with a mass spectrometer (MS) connected to the gas chromatograph. Analytes eluted from the capillary column are introduced into the mass spectrometer via a jet separator or a direct connection. Identification of target analytes is accomplished by comparing their mass spectra with the electron impact (or electron impact-like) spectra of authentic standards. Quantitation is accomplished by comparing the response of a major (quantitation) ion relative to an internal standard using a five-point calibration curve. NOTE: This method can be used in conjunction with the following sample preparation procedures: Water (including TCLP leachates) - Methods 3510, 3520, 3535 Soil/sediment - Methods 3540, 3541, 3545, 3546 3550, 3560, 3561	**USEPA Method 8270E**
Phenols/PAHs/PCBs/OPPs/OCs	Soil - 10g soil, surrogates, mixed with anhydrous sodium sulfate and extracted with 20mL dichloromethane/acetone (1:1), and tumbled for a minimum of 1 hour. Clay samples must be completely disintegrated before an aliquot is taken for analysis. Water - 250ml water sample plus surrogates triple extracted with dichloromethane (base and neutrals). Leachate - 250ml water sample plus surrogates triple extracted with dichloromethane (base and neutrals). Analysis by capillary column GC/MS (Eurofins in-house Methods LTM-ORG-	**USEPA Method 8270E**

Analyte	Method	Reference Method
	2130, LTM-ORG-2140 Method: LTM-GEN-7080 Moisture).	
Analysis of Phenoxy Acid Herbicides in Aqueous and Soil Samples by HPLC	A 100-mL water sample is adjusted to a basic pH with sodium hydroxide, shaken, and allowed to set for 1 hour to hydrolyse chlorinated esters. The sample is acidified with H_3PO_4, filtered, and the chlorinated acids are extracted from a 20-mL aliquot. The aliquot is pumped through a high performance liquid chromatography (HPLC) cartridge (containing C-18-silica), trapping the chlorinated acids. The concentrator cartridge is valved in-line with the C-18 analytical column following extraction. The acids are separated by HPLC and detected using an ultraviolet (UV) absorption spectrometer. LABORATORY TEST METHOD NUMBER: LTM-ORG-2180 Soil - 10g soil, surrogates, mixed with anhydrous sodium sulfate are extracted using acetonitrile in an ultrasonic bath, or shaker filtered, diluted with water as appropriate, adjusted to a basic pH with sodium hydroxide, shaken, and allowed to set for 1 hour to hydrolyse chlorinated esters. The sample is acidified with H_3PO_4, filtered, and the chlorinated acids are extracted from a 20-mL aliquot. The aliquot is pumped through a high performance liquid chromatography (HPLC) cartridge (containing C-18-silica), trapping the chlorinated acids. The concentrator cartridge is valved in-line with the C-18 analytical column following extraction. The acids are separated by HPLC and detected using an ultraviolet (UV) absorption spectrometer. LABORATORY TEST METHOD NUMBER: LTM-ORG-2180	**US EPA -NERL: Method 555: Chlorinated Acids in Water Using HPLC/UV**
EXPLOSIVES **Nitroaromatics, nitramines, and nitrate esters by high performance liquid chromatography (HPLC)**	Soil - 10g soil, surrogates, mixed with anhydrous sodium sulfate are extracted using acetonitrile in an ultrasonic bath, or shaker filtered, diluted with water as appropriate, and analysed by HPLC with UV/DAD detection. Clay samples must be completely disintegrated before an aliquot is taken for analysis. Water - 250ml water sample plus surrogates are pre-concentrated using solid-phase extraction, as described in USEPA Method 3535 and then diluted with	**USEPA Method 8330B**

<table>
<tr><th>Analyte</th><th>Method</th><th>Reference Method</th></tr>
<tr><td></td><td>water as appropriate for the selected separations.
Leachate - 250ml water sample plus surrogates extracted with SPE.</td><td></td></tr>
<tr><td>DIOXINS
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC/HRMS↟</td><td>This method is for determination of tetra- through octa-chlorinated dibenzo-p-dioxins (CDDs) and dibenzofurans (CDFs) in water, soil, sediment, sludge, tissue, and other sample matrices by high resolution gas chromatography/high resolution mass spectrometry (HRGC/HRMS). The seventeen 2,3,7,8-substituted CDDs/CDFs may be determined by this method. Specifications are also provided for separate determination of 2,3,7,8-tetrachloro-dibenzo-p-dioxin (2,3,7,8-TCDD) and 2,3,7,8-tetrachloro-dibenzofuran (2,3,7,8-TCDF).
The detection limits and quantitation levels in this method are usually dependent on the level of interferences rather than instrumental limitations.
↟Analysis subcontracted to Eurofins GfA Lab Service GmbH – Hamburg, Germany</td><td>USEPA Method 1613B</td></tr>
<tr><td>PBDEs
Polybrominated diphenyl ethers by HRGC/HRMS↟</td><td>This method is for determination of polybrominated diphenyl ethers in water, soil, sediment, sludge, tissue, and other sample matrices by high resolution gas chromatography/high resolution mass spectrometry (HRGC/HRMS).
<table>
<tr><th>TriBDE</th><th>TetraBDE</th><th>PentaBDE</th></tr>
<tr><td>BDE-17
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BDE-126</td></tr>
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BDE-191</td><td>BDE-196
BDE-197</td></tr>
<tr><th>NonaBDE</th><th>DecaBDE</th><th></th></tr>
<tr><td>BDE-206
BDE-207</td><td>BDE-209</td><td></td></tr>
</table>
The detection limits and quantitation levels in this method are usually dependent on the level of interferences rather than instrumental limitations.
↟Analysis subcontracted to Eurofins GfA Lab Service GmbH – Hamburg, Germany</td><td>Method 1614A
Brominated Diphenyl Ethers in Water, Soil, Sediment, and Tissue by HRGC/HRMS
May 2010</td></tr>
</table>

Analyte	Method	Reference Method
Inorganics		
Total Metals (As, Cd, Cr, Cu, Ni, Pb, Zn)	A portion of soil or water undergoes acidic digestion using either microwave or automated hot block. Analysis by ICP-AES or ICP-MS. (Eurofins in-house method ICP-AES LTM-MET-3030, ICP-MS LTM-MET-3040 LTM-GEN-7080 Moisture).	**USEPA Method 6010D** **USEPA Method 3050B** **USEPA Method 3051A** **USEPA Method 6020B** **USEPA Method 3010A** **USEPA Method 3015A**
Total Mercury (Hg)	A portion of soil or water undergoes acidic digestion using either microwave or automated hot block. Analysis by ICP/MS.(Eurofins in-house method LTM-MET-3030, LTM-GEN-7080 Moisture).	**USEPA Method 6010D** **USEPA Method 3050B** **USEPA Method 3051A**
Filtered Metals (As, Cd, Cr, Cu, Ni, Pb, Zn)	Filtered (0.45µm) and acidified in the field prior to analysis. Analysis by ICP-MS. (Eurofins in-house method LTM-MET-3040).	**USEPA Method 6020B** **USEPA Method 3010A** **USEPA Method 3015A**
Filtered Mercury (Hg)	Filtered, oxidation and final reduction. Analysis by FIMS. (Eurofins in-house method LTM-MET-3040).	**USEPA Method 7471B** **USEPA Method 3010A** **USEPA Method 3015A**
Water Laboratory		
Alkalinity	Alkalinity is a measure of the acid neutralising capacity of waters. It is a measure of how much acid (H+) is required to lower the pH to a specific level. In most waters, alkalinity is a function of the concentrations of carbonate [CO32-], bicarbonate [HCO3-] and hydroxyl [OH-] ions present. For this method it is assumed that other weak inorganic or organic acids, such as silicic, phosphoric and boric acids are absent. Measuring alkalinity is important in determining a stream's ability to neutralise acidic pollutants from rainfall or wastewater. Total alkalinity is affected by environmental factors; rain, acidic sanitisers, addition of fill water and other product applications can all change the alkalinity over time. Most alkalinity in surface water comes from calcium carbonate (CaCO3), being leached from rocks and soil. This process is enhanced if the rocks and soil have been broken up for any reason, such as mining or urban development. Alkalinity is significant in the treatment of wastewater and drinking water because it will influence treatment process such as anaerobic digestion. Water may be unsuitable for use in irrigation if the	**APHA 2320 B.**

Analyte	Method	Reference Method
	alkalinity level in the water is higher than the natural level of alkalinity in the soil. This method covers the determination of alkalinity of all types of water. Alkaline ions present in the sample are neutralised by titration with a standard acid solution. Titration to different pH endpoints allows ion speciation to be determined. This method determines alkalinity relative to pre-designated endpoints measured by a pH meter. The end-points designated are pH 8.3 (Phenolphthalein Alkalinity) and pH 4.5 (Total Alkalinity). Titration by colour can also be used to analyse alkalinity, refer to APHA Method 2320 B (2.1) for details. Alkalinity is expressed in terms of the amount of calcium carbonate that would need to be dissolved in fresh water to give the same alkalinity. Alkalinity is reported as mg CaCO3/L. The typical range of applicability is 20 – 4000 mg CaCO3/L. Range can be extended with smaller sample volume and/or alternate titrant concentration(s).	
Ammonia in Water	Alkaline phenol and hypochlorite react with ammonia to form indophenol blue that is proportional to the ammonia concentration. The blue colour is intensified with sodium nitroprusside. This method determines ammonia in drinking, surface, and saline waters; domestic and industrial wastes.	**APHA 4500-NH3 B, C, D, F, H**
Anions in Water	Bromide; bromate; chloride; chlorite; chlorate; fluoride; iodide; nitrate; nitrite; phosphate; sulfate by IC using in-house E045.1/ LM-LTM- INO-4300.	**APHA 4110 B**
Anions in Soils	Tests for water-soluble anions on milled air-dry sample are suitable for use on all soils in clarified/filtered1:5 soil/water extracts. Bromide; bromate; chloride; chlorite; chlorate; fluoride; iodide; nitrate; nitrite; phosphate; sulfate by IC using in-house E045.1/ LM-LTM- INO-4300.	**APHA 4110 B**
Biochemical Oxygen Demand (5 days, 20^{o}C)	The BOD test is an empirical bioassay-type test which measures the dissolved oxygen consumed by microbial life while assimilating and oxidising organic matter in a sample. A waste sample (or dilution) is incubated for five days 20^{o}C in the dark. Dissolved oxygen is measured before and after incubation using a modified Winkler or oxygen probe method. The reduction in	**APHA 5210**.

Analyte	Method	Reference Method
	dissolved oxygen during the incubation period yields a measure of BOD.	
Chemical Oxygen Demand (COD)	Most types of organic matter are oxidized by a boiling mixture of chromic and sulfuric acids. A sample is refluxed in strongly acid solution with a known excess of potassium dichromate ($K_2Cr_2O_7$). After digestion, the remaining unreduced $K_2Cr_2O_7$ is titrated with ferrous ammonium sulfate to determine the amount of $K_2Cr_2O_7$ consumed and the oxidisable matter is calculated in terms of oxygen equivalent. Keep ratios of reagent weights, volumes, and strengths constant when sample volumes other than 50 mL are used. The standard 2-h reflux time may be reduced if it has been shown that a shorter period yields the same results. Some samples with very low COD or with highly heterogeneous solids content may need to be analysed in replicate to yield the most reliable data. Results are further enhanced by reacting a maximum quantity of dichromate, provided that some residual dichromate remains.	**APHA 5220 C**.
Chloride - 1:5 soil/water extract	Tests for water-soluble chloride (Cl) on milled air-dry sample are suitable for use on all soils. For method 5A1, Cl^- in clarified 1:5 soil/water extracts is determined by potentiometric titration with AgNO3 in conjunction with an Ag/AgNO3 electrode array. For method 5A2a, Cl- in clarified 1:5 soil/water extracts is determined by an automated, continuous flow colorimetric procedure based on the formation — in the presence of ferric ions and free thiocyanate ions — of highly coloured ferric thiocyanate in proportion to the Cl- concentration. Method 5A2b is similar, except it pertains to the use of flow injection analysis (FIA). For 5A1 and 5A2 methods, it is assumed there are no chemical interferences of significance. Moreover, Method 5A2a has proven more precise than method 5A1, particularly at soil concentrations <50 mg Cl/kg. Other analytical finish options involve chemically-suppressed ion chromatography (5A3a), single-column electronically suppressed ion chromatography (5A3b), and direct measurement by ICPAES (Method 5A4). The methodology specifies reporting results on an air-dry basis.	**APHA Method 4500-Cl Rayment & Higginson 1992, "Australian Laboratory Handbook of Soil and Water Chemical. Methods".** **NEPM 2013 - Schedule B3 - Guideline on Laboratory Analysis of Potentially Contaminated Soil**

Analyte	Method	Reference Method
Chromium - hexavalent	This procedure measures only hexavalent chromium, (Cr6+). The hexavalent chromium is determined colorimetrically by reaction with diphenylcarbazide in acid solution. A red-violet coloured complex of unknown composition is produced. The colorimetric method is useful for the determination of hexavalent chromium in a natural or treated water in the range from 0.005 to 1 mg/L. This range can be extended by appropriate sample dilution or concentration and/or use of longer cell paths. Normal level analyses in waters uses in-house LTM- INO-4100 Analysis of hexavalent chromium in water by discrete analyser.	**APHA Standard Methods for the Examination of Water & Wastewater. 23rd Edition 2017. 3500-Cr-B**
Colour - Visual Comparison Method	Colour is determined by visual comparison of the sample with known concentrations of coloured solutions. Comparison also may be made with special, properly calibrated glass colour disks. The platinum-cobalt method of measuring colour is the standard method, the unit of colour being that produced by 1 mg platinum/L in the form of the chloroplatinate ion. The ratio of cobalt to platinum given (2120B.4) matches the colour of natural waters.	**APHA 2120 B**.
Cyanide	Free Cyanide (CN_F) Only hydrogen cyanide and the cyanide ion in solution can be classed as "free" cyanide. The proportions of HCN and CN- in solution are according to their equilibrium equation; this is influenced by the solution pH. Methods used to detect free cyanide should not alter the stability of weaker cyanide complexes, as they may otherwise be included in the free cyanide result. Methods used to detect free cyanide should be clear of interferences due to the presence of high concentrations of more stable cyanide complexes or other cyanide forms. If not, the interference must be quantified and allowed for in the result. Weak Acid Dissociable Cyanide (CN_{WAD}) Unlike the definition of "free cyanide" which identifies the specific cyanide species being measured, WAD cyanide refers to those cyanide species measured by specific analytical techniques. WAD cyanide includes those cyanide species	**APHA 4500-CN B, C, D, E, I, N, O and USEPASW 846 9010, 9013, 9014, 9213**.

Analyte	Method	Reference Method
	liberated at moderate pH of 4.5 such as HCN(aq) and CN-, the majority of Cu, Cd, Ni, Zn, Ag complexes and others with similar low dissociation constants. Methods used to measure WAD should be free from interferences due to the presence of high concentrations of more stable cyanide complexes or other cyanide forms. If not, the interference must be quantified and allowed for in the result. Total Cyanide (CN_T) This measurement of cyanide includes all free cyanide, all dissociable cyanide complexes and all strong metal cyanide including ferro-cyanide $Fe(CN)_6^{4-}$, ferri-cyanide $Fe(CN)_6^{3-}$, and portions of hexacyano cobaltate $Co(CN)_6^{3-}$, and those of gold and platinum. Only the related or derived compounds cyanate (CNO-) and thiocyanate (SCN-) are excluded from the definition of total cyanide. Methods used to determine total cyanide must be shown to be capable of quantitatively determining all stable complexes of cyanide, including the cobalt cyanide complex. If methods determine other analytes as well (e.g. include SCN^-), those analytes need to be determined separately and allowed for in the total result. In-house method LTM-INO-4020 Total and Free plus Weak Acid Dissociable Cyanide by Continuous Flow Analysis	
Electrical Conductivity/Resistivity	This in-house method will determine the concentration of ions in a soil-water suspension, expressed in µS/cm units. The conductivity is measured electrometrically at constant temperature (e.g. 25°C). E032.2 in soil type matrices by conductivity meter	**NEPM** **Schedule B3**
Ferrous (Fe^{2+})	Iron is brought into solution, reduced to the ferrous state by boiling with acid and hydroxylamine, and treated with 1,10-phenanthroline at pH 3.2 to 3.3. Three molecules of phenanthroline chelate each atom of ferrous iron to form an orange-red complex. The coloured solution obeys Beer's law; its intensity is independent of pH from 3 to 9. A pH between 2.9 and 3.5 insures rapid colour development in the presence of an excess of phenanthroline. Colour standards are stable for at least 6	**APHA 3500-Fe B Phenanthroline Method**

Analyte	Method	Reference Method
	months. Ferrous iron by DA using in-house LTM-INO-4190.	
Fluoride in Water	Fluoride is determined potentiometrically using a fluoride electrode in conjunction with a standard single junction sleeve-type reference electrode and a pH meter having an expanded millivolt scale or a selective ion meter having a direct concentration scale for fluoride using APHA 4500-F C. This method determines fluoride in drinking, surface, and saline waters; domestic and industrial wastes.	**APHA 4500-F^- C.**
Fluoride in Soils	Total fluoride by combustion ion chromatography (CIC) using in-house LTM-INO-4150 (Part A)	**ASTM D7359 Standard Test Method for Total Fluorine, Chlorine and Sulfur in Aromatic Hydrocarbons and Their Mixtures by Oxidative Pyrohydrolytic Combustion followed by Ion Chromatography Detection (Combustion Ion Chromatography-CIC).**
Methylene blue active substances (MBAS)	Methylene blue active substances (MBAS) bring about the transfer of methylene blue, a cationic dye, from an aqueous solution into an immiscible organic liquid upon equilibration. This occurs through ion pair formation by the MBAS anion and the methylene blue cation. The intensity of the resulting blue colour in the organic phase is a measure of MBAS. Anionic surfactants are among the most prominent of many substances, natural and synthetic, showing methylene blue activity. The MBAS method is useful for estimating the anionic surfactant content of waters and wastewaters, but the possible presence of other types of MBAS always must be kept in mind. This method is relatively simple and precise. It comprises three successive extractions from acid aqueous medium containing excess methylene blue into chloroform (CHCl3), followed by an aqueous backwash and measurement of the blue colour in the CHCl3 by spectrophotometry at 652 nm using in-house LTM-INO-4030 MBAS as MW: 288 (filtered).	**APHA 5540 C**
Nitrite, Total Oxidised Nitrogen	A discrete analysis is a system of quantitative spectrophotometric	**APHA 4500-NO_3^-**

Analyte	Method	Reference Method
(NOx) and Nitrate with photometric detection using Discrete Analyser	determinations utilising automated analytical techniques to perform chemical reactions with high precision and reliability. The sample and the reagents are pipetted by the instrument into a cell and mixed before incubation. After incubation, the absorbance of the solution is measured at the wavelength applicable to the determination. Nitrite (NO_2^-) is determined through formation of a reddish purple azo dye produced at pH 2.0 to 2.5 by coupling diazotised sulfanilamide with N-(1-naphthyl)-ethylenediamine dihydrochloride (NED dihydrochloride). The colour system is measured at 540 nm. The applicable detection range of spectrophotometric measurements, as dictated by Beer's Law, is 10 to 1000 µg NO_2^- N/L, with Method Detection Limits (MDL) and Limits of Reporting (LOR) determined within this range. See method validation for detail. Higher concentrations can be determined by diluting the sample. Total Oxidised Nitrogen (NO_X) Nitrate (NO_3^-) is reduced to nitrite (NO_2^-) by vanadium chloride. The total nitrite ions (Total Oxidised Nitrogen, TON, NO_X) are then reacted with sulphanilamide and NED dihydrochloride under acidic conditions to form a pink azo-dye. The absorbance is measured at 540 nm and is related to the NO_X concentration by means of a calibration curve. Higher concentrations can be determined by diluting the sample. Nitrate concentration is a result of the calculation of NOX concentration minus nitrite concentration noting the need for standardised units (i.e. mg N/L, or "as N"). Nitrogen-nitrate, nitrite, oxides of nitrogen, total by DA using in-house LTM-INO-4350	
Oil and Grease	This method is for determination of n-hexane extractable material (HEM; oil and grease) and n-hexane extractable material that is not adsorbed by silica gel (SGT-HEM; non-polar material) in surface and saline waters and industrial and domestic aqueous wastes. Extractable materials that may be determined are relatively non-volatile hydrocarbons, vegetable oils, animal fats, waxes, soaps, greases, and	**USEPA Method 1664, Revision A n-Hexane Extractable Material (HEM; Oil and Grease) and Silica Gel Treated n-Hexane Extractable Material (SGT-HEM; Non-polar Material)**

Analyte	Method	Reference Method
	related materials. The method is based on prior United States Environmental Protection Agency (US EPA) methods for determination of "oil and grease" and "total petroleum hydrocarbons". The term "n-hexane extractable material" reflects that this method can used to determine materials other than oils and greases. Similarly, the term "silica gel treated n-hexane extractable material" reflects that this method can be used to determine material that is not adsorbed by silica gel (non-polar material). This method is not applicable to measurement of materials that volatilise at temperatures below approximately 85°C. Petroleum fuels from gasoline through #2 fuel oil may be partially lost in the solvent removal operation. Some crude oils and heavy fuel oils contain a significant percentage of materials that are not soluble in n-hexane. Accordingly, recoveries of these materials may be low. This method is capable of measuring HEM and SGT-HEM in the range of 10 to 1000 mg/L, and may be extended to higher levels by analysis of a smaller sample volume collected separately.	**by Extraction and Gravimetry**
% Organic Matter	Gravimetric determination based on ashing at >600 °C	**NEPM Schedule B3**
pH in Soils (1:5 aqueous extract) **pH in Soils (1:5 $CaCl_2$ extract)**	This in-house method will determine the concentration of hydrogen ions (H+) in a soil-water or soil-calcium chloride suspension, expressed in pH units. The pH is measured electrometrically at constant temperature (e.g. 25°C). LTM-GEN-7090_R0 pH electrometric measurement in water & soil-type matrices by ISE.	**NEPM Schedule B3**
Phosphorus	Phosphorus analyses embody two general procedural steps: (a) conversion of the phosphorus form of interest to dissolved orthophosphate, and (b) colorimetric determination of dissolved orthophosphate. The separation of phosphorus into its various forms is defined analytically but the analytical differentiations have been selected so that they may be used for interpretive purposes. Filtration through a 0.45-µm-pore-diam membrane filter separates dissolved from suspended forms of phosphorus. No claim	**APHA 4500 P**.

Analyte	Method	Reference Method
	is made that filtration through 0.45-µm filters is a true separation of suspended and dissolved forms of phosphorus; it is merely a convenient and replicable analytical technique designed to make a gross separation. Pre-filtration through a glass fibre filter may be used to increase the filtration rate. Phosphates that respond to colorimetric tests without preliminary hydrolysis or oxidative digestion of the sample are termed “reactive phosphorus.” While reactive phosphorus is largely a measure of orthophosphate, a small fraction of any condensed phosphate present usually is hydrolysed unavoidably in the procedure. Reactive phosphorus occurs in both dissolved and suspended forms. Acid hydrolysis at boiling-water temperature converts dissolved and particulate condensed phosphates to dissolved orthophosphate. The hydrolysis unavoidably releases some phosphate from organic compounds, but this may be reduced to a minimum by judicious selection of acid strength and hydrolysis time and temperature. The term “acid-hydrolysable phosphorus” is preferred over “condensed phosphate” for this fraction. The phosphate fractions that are converted to orthophosphate only by oxidation destruction of the organic matter present are considered “organic” or “organically bound” phosphorus. The severity of the oxidation required for this conversion depends on the form—and to some extent on the amount—of the organic phosphorus present. Like reactive phosphorus and acid-hydrolysable phosphorus, organic phosphorus occurs both in the dissolved and suspended fractions. The total phosphorus as well as the dissolved and suspended phosphorus fractions each may be divided analytically into the three chemical types that have been described: reactive, acid hydrolysable, and organic phosphorus. As indicated, determinations usually are conducted only on the unfiltered and filtered samples. Suspended fractions generally are determined by difference; however, they may be determined directly by digestion of the material retained on a glass-fibre filter.	

Analyte	Method	Reference Method
Sulfate (as SO_4^{2-})	Sulfate ion (SO_4^{2-}) is precipitated in an acetic acid medium with barium chloride ($BaCl_2$) so as to form barium sulfate ($BaSO_4$) crystals of uniform size. Light absorbance of the $BaSO_4$ suspension is measured by a photometer and the SO_4^{2-} concentration is determined by comparison of the reading with a standard curve using in-house LTM-INO-4110 Sulfate by Discrete Analyser	**APHA 4500- SO_4^{2-} E. Turbidimetric Method***
Total Organic Carbon in Water	Total Carbon (TC) is measured by injecting a portion of the water sample into a heated combustion tube packed with an oxidation catalyst. The water is vaporised and TC, the organic carbon and the inorganic carbon, is converted to carbon dioxide (CO2). The carbon dioxide is carried with the carrier gas stream from the combustion tube to a NDIR (non-dispersive infrared gas analyser) and concentration of carbon dioxide is measured. The TC concentration of the sample is obtained by using the calibration curve prepared with standard solutions. Inorganic Carbon (IC) is measured by injecting a portion of the sample into an IC reaction chamber filled with phosphoric acid solution. All IC is converted to carbon dioxide and concentration of carbon dioxide is measured with a NDIR. TOC may be obtained as the difference of TC and IC.	**APHA 5310 B**
Total Dissolved Solids (TDS) Dried at 180°C	A well-mixed sample is filtered through a standard glass fibre filter. The filtrate is evaporated and dried to constant weight at 180°C. This method determines filterable residue in drinking, surface, and saline waters; domestic and industrial wastes. (A) Mineral Waters: Highly mineralized waters containing significant concentrations of calcium, magnesium, chloride and/or sulfate may be hygroscopic and will require prolonged drying, desiccation and rapid weighing. (B) Bicarbonate: Samples containing high concentrations of bicarbonate will require careful and possibly prolonged drying at 180oC to insure that all the bicarbonate is converted to carbonate. (C) High Residue Levels: Too much residue in the evaporating dish will crust over and entrap water that will not be	**APHA 2540 C.**

Analyte	Method	Reference Method
	driven off during drying. Total residue should be limited to about 200 mg. in-house method LTM-INO-4170.	
Total Suspended Solids (TSS) Dried at 103–105°C	Suspended solids are those that are retained on a glass-fibre filter. The unfiltered sample is mixed thoroughly and an appropriate volume is rapidly poured into a graduated cylinder. The suspended solids are collected on a glass fibre filter, and the insoluble residue is dried at 104 ± 1°C and weighed. This method may be used to determine the suspended-solids concentration of any natural or treated water or industrial waste. In-house method LTM-INO-4070	**APHA 2540 D.**
Fixed and Volatile Solids Ignited at 550°C	The residue from LTM-INO-4070 or LTM-INO-4170 is ignited to constant weight at 550°C. The remaining solids represent the fixed total, dissolved, or suspended solids while the weight lost on ignition is the volatile solids. The determination is useful in control of wastewater treatment plant operation because it offers a rough approximation of the amount of organic matter present in the solid fraction of wastewater, activated sludge, and industrial wastes.	**APHA 2540 E.**
Residue, Volatile (Gravimetric, Ignition at 550°C)	The residue obtained from the determination of total, filterable or non-filterable residue is ignited at 550°C in a muffle furnace. The loss of weight on ignition is reported as mg/L volatile residue. This method determines the weight of solid material combustible at 550°C. The test is useful in obtaining a rough approximation of the amount of organic matter present in the solid fraction of sewage, activated sludge, industrial wastes, or bottom sediments.	**APHA 2540 E.**
General		
Cation exchange capacity (CEC)	Cation exchange capacity (CEC) is a measure of the soil's ability to hold positively charged ions. It is a very important soil property influencing soil structure stability, nutrient availability, soil pH and the soil's reaction to fertilisers and other ameliorants (Hazleton and Murphy 2007). The clay mineral and organic matter components of soil have negatively charged sites on their surfaces which	**NEPM** **Schedule B3**

Analyte	Method	Reference Method
	adsorb and hold positively charged ions (cations) by electrostatic force. This electrical charge is critical to the supply of nutrients to plants because many nutrients exist as cations (e.g. magnesium, potassium and calcium). In general terms, soils with large quantities of negative charge are more fertile because they retain more cations (McKenzie et al. 2004) however, productive crops and pastures can be grown on low CEC soils. The main ions associated with CEC in soils are the exchangeable cations calcium (Ca^{2+}), magnesium (Mg^{2+}), sodium (Na^{+}) and potassium (K^{+}) (Rayment and Higginson 1992), and are generally referred to as the base cations. In most cases, summing the analysed base cations gives an adequate measure of CEC ("CEC by bases"). However, as soils become more acidic these cations are replaced by H^{+}, Al^{3+} and Mn^{2+}, and common methods will produce CEC values much higher than what occurs in the field (McKenzie et al. 2004). NOTE: Only CEC & ESP are calculated by this method. Conducted by in-house Method LTM-MET-3060 – Cation Exchange Capacity (CEC) by bases & Exchangeable Sodium Percentage (ESP).	
Clay Content	This method is based on the Soil Classification assessment by Hydrometer outlined in the Australian Standard 1289.3.6.3 (Determination of the particle size distribution of a soil – Standard method of fine analysis using a hydrometer). This method quantitatively determines the physical proportions of three sizes of primary soil particles, by determining their settling rates in an aqueous solution using a hydrometer. The three categories of particles measured are defined as follows:- 1. Sand Ranges from 2000 to 50µm 2. Silt Ranges from 50-2µm 3. Clay Less than 2µm Settling rates of primary soil particles are measured using a hydrometer.	**AS1289.3.6.3**
Moisture	Gravimetric determination based on drying at 103-105 ^{o}C. MOISTURE CONTENT IN SOIL OR OTHER SOLID MATRICES BY GRAVIMETRY LTM-GEN-7080 Moisture.	**NEPM** **Schedule B3**

Analyte	Method	Reference Method
Leaching Procedures	This in-house method is for the preparation of leachates collected from soil, sediments, sludges, and other solid matrices using a rotary vessel extraction procedure. The method allows for the substitution of laboratory grade de-ionised water, EP or SPLP fluids, or site water supplied by the client as the extraction fluid. The solid portion of the sample is reduced in particle size, if necessary, and leached by rotary vessel agitation with a selected leaching fluid. The sample leachate is then extracted/ analysed by an additional test method, as per client request. (Eurofins in-house method LEACHING PROCEDURE FOR VOLATILE AND NON-VOLATILE ANALYTES FROM SOILS AND SOLID WASTES LTM-GEN-7010.	**Toxicity Characteristic Leaching Procedure (TCLP) USEPA Method 1311** **Australian Standard Leaching Procedure (ASLP) AS 4439.2: 2019; AS4439.3: 2019**
LEAF 1313	Liquid –Solid Partitioning as a Function of Extract pH for Constituents in Solid Materials using a Parallel Batch Extraction Procedure. Nine (9) Parallel extractions of a particle sized reduced solid material in dilute acid or base and reagent water. Series of eluates having pH values ranging from 2-13. Liquid solid ratio of 10:1. Eluate is centrifuged and filtered for COPCs. Designed to provide aqueous extracts representing the liquid-solid portioning [LSP] curve as a function of pH for inorganics and non-volatile organics in solid materials	**EPA SW-846 Method 1313**
LEAF 1314	Liquid –Solid Partitioning as a Function of Liquid-Solid Ration for Constituents in Solid Materials using an Up-Flow Percolation Column Procedure Eluent is introduced into a column with packed particle sized reduced solid material in an up-flow pumping mode. Flow rate is maintained between 0.5-1.0 LS/Day. Eluent is collected at predetermined times, filtered and analysed for COPCs. Total time of test is approximately 14 days. Designed to provide the liquid – solid portioning [LSP] of inorganic constituents and non-volatile organics in granular solid material as a function of liquid to solid [LS] ratio under percolation conditions.	**EPA SW-846 Method 1314**

Analyte	Method	Reference Method
LEAF 1315	Mass Transfer Rates of Constituents in Monolithic or Compacted Granular Materials using a Semi-dynamic Tank Leaching Procedure. Leaching of continuously water saturated monolithic or compacted granular material in an eluent-filled tank with periodic renewal of the leaching solution. LS ratio of 9 mL eluent per cm2 of surface area. Eluent is collected at predetermined times and analysed for COPCs. Eluate is centrifuged and filtered for COPCs. Total time of test is 63 days. Designed to provide the mass transfer [release rates] of inorganic analytes contained in a monolith or compacted granular material. Under diffusion controlled release conditions, as a function of leaching time.	**EPA SW-846 Method 1315**
LEAF 1315	Mass Transfer Rates of Constituents in Monolithic or Compacted Granular Materials using a Semi-dynamic Tank Leaching Procedure. Leaching of continuously water saturated monolithic or compacted granular material in an eluent-filled tank with periodic renewal of the leaching solution. LS ratio of 9 mL eluent per cm^2 of surface area. Eluent is collected at predetermined times and analysed for COPCs. Eluate is centrifuged and filtered for COPCs. Total time of test is 63 days. Designed to provide the mass transfer [release rates] of inorganic analytes contained in a monolith or compacted granular material. Under diffusion controlled release conditions, as a function of leaching time.	**EPA SW-846 Method 1315**
LEAF 1316	Liquid- Solid Partitioning as a Function of Liquid-Solid Ratio for Constituents in Solid Materials using a Parallel Batch Extraction Procedure. Five (5) Parallel extractions of a particle-size reduced solid material in reagent water over a range of L/S values from 0.5 to 10 mL eluant/g dry material. Depending on particle size, sample is tumbled between 24 and 72 hours. Eluate is centrifuged and filtered for COPCs. Designed to provide the liquid-solid portioning{LSP] of inorganic and non-	**EPA SW-846 Method 1316**

Analyte	Method	Reference Method
	volatile organics at the natural pH of the solid material as a function of liquid to solid ratio [L/S] under conditions that approach liquid-solid chemical equilibrium.	
Asbestos		
Asbestos in Soils	The whole sample submitted is first dried and then sieved through a 10mm sieve followed by a 2mm sieve. All fibrous matter viz greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) Iron ores - Sampling and Sample preparation procedures is employed. Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis in accordance with AS 4964-2004. Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. Bulk samples include building materials, soils and ores	**AS 4964–2004**
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated and where required interfering organic fibres or matter may be removed by treating the sample for several hours at a temperature not exceeding 400 ± 30°C. The resultant material is then ground and examined in accordance with AS 4964-2004.and ores	**AS 4964–2004**
Asbestos fibres in Air	Conducted in accordance with the National Occupational Health & Safety Commission - Guidance Note on The Membrane Filter Method For Estimating Airborne Asbestos Fibres 2nd Edition [NOHSC:3003(2005)] and in-house Method LTM-ASB-8010.	**NOHSC:3003(2005)**
Air		

Analyte	Method	Reference Method
Filters - Total Metals (As, Cd, Cr, Cu, Ni, Pb, Zn)	The filter is digested in a hot block set to 95°C for 2.5 hours using an extraction fluid containing hydrochloric acid (HCl) and nitric acid (HNO_3). Two aliquots of hydrogen peroxide (H_2O_2) are added after 1.5 hours and 2.0 hours of extraction and are allowed to effervesce. After extraction, the samples are filtered and diluted to a final volume of 50 mL. The extract is analysed by ICP-MS and the data are collected using the manufacturer's software.	**EQL-0512-201 - US Environmental Protection Agency**
Microbiology		
Method for Isolation, Enumeration and Confirmation of Sulfite Reducing Clostridia and *Clostridium perfringens* from Raw, Potable, Process and Recreational Waters by Membrane Filtration	Tests for sulfite-reducing clostridia play only a subsidiary role in water examination. The organisms form spores which are environmentally resistant and their presence may indicate soil contamination, although some species may grow in deposits, and be associated with corrosion of distribution pipes. *Clostridium perfringens* is a sulfite-reducing species and is associated with faecal contamination. The method involves a volume of sample that is filtered and the membrane filter placed on the surface of an agar medium containing sulfite, iron(III) and D-cycloserine (which inhibits other bacteria and reduces the size of colonies that develop). The agar medium is then incubated under anaerobic conditions at 37 °C. Sulfite-reducing clostridia usually produce black colonies as a result of the reduction of sulfite to sulfide, which then reacts with the iron(III) salt. If only a spore count is required then the sample is heat-treated at 60 °C prior to filtration in order to kill vegetative bacteria. In-house method Sulfite-Reducing Clostridia - Membrane Filtration Method: LTM-MIC-6617	**UK Environment Agency, The Microbiology of Drinking Water (2010), Part 6 – Methods for the isolation and enumeration of sulphite-reducing clostridia and *Clostridium perfringens* by membrane filtration.**
Detection of Male-specific & Somatic Coliphages in Water	Method uses the single agar layer (SAL) procedure. A 100-mL ground water sample is assayed by adding $MgCl_2$ (magnesium chloride), log-phase host bacteria (E. coli F_{amp} for F+ coliphage and E. coli CN-13 for somatic coliphage), and 100 mL of double-strength molten tryptic soy agar to the	**USEPA Method 1602: Male-specific (F+) and Somatic Coliphage in Water by Single Agar Layer (SAL) Procedure April 2001**

Analyte	Method	Reference Method
	sample. The sample is thoroughly mixed and the total volume is poured into 5 to 10 plates (dependent on plate size). After an overnight incubation, circular lysis zones (plaques) are counted and summed for all plates from a single sample. The quantity of coliphage in a sample is expressed as plaque forming units (PFU) / 100 mL. For quality control purposes, both a coliphage positive reagent water sample and a negative reagent water sample (method blank) are analysed for each type of coliphage with each sample batch.	
Air Toxics Laboratory		
TRH by Modified US EPA TO-15*	The laboratory performed analysis following modified EPA TO-15 for Total Recoverable Hydrocarbon (TRH) fractions using electron ionisation GC/MS in full scan mode. The method involves concentrating up to 0.2 litres of air. The concentrated aliquot is then flash vaporised and swept through a water management system to remove water vapour. Following dehumidification, the sample passes directly into the GC-MS for analysis. All sample-related peaks including BTEX and naphthalene eluting within their respective carbon range are included in the TRH result. The >C6-C10 TRH range is defined as the total ion area of peaks eluting after n-Hexane and including n-Decane referenced to the response factor of Toluene. The >C10-C12 TRH range is defined as the total area of peaks eluting after n-Decane and including n-Dodecane and reference to the response factor of n-Decane. Hydrocarbons heavier than C12 do not reliably recover from summa canisters due to their low vapour pressure. As a result, the reported range was limited to C12 rather than C16 as defined in Table C1[1]. If requested, the fraction >C6-C10 minus BTEX (F1) and >C10-C12 minus naphthalene (modified F2) were reported following the definition listed in the previous paragraph except BTEX and	**USEPA Compendium Method TO-15 Determination Of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS)**

[1] CRC CARE 2013, Petroleum hydrocarbon vapour intrusion assessment: Australian guidance, CRC CARE Technical Report no. 23, CRC for Contamination Assessment and Remediation of the Environment, Adelaide, Australia.

Analyte	Method	Reference Method
	naphthalene peaks were removed from the total ion peak area. Naphthalene elutes outside the >C10-C12 range on the system used for sample analysis. As a result, >C10-C12 TRH value is equivalent to the modified F2 value.	
Modified US EPA TO-15 & VPH Fractions*	The laboratory performed analysis via EPA Method TO-15 and Eurofins Air Toxics VPH (Volatile Petroleum Hydrocarbon) methods for the Determination of VPH Fractions using GC/MS in the full scan mode. The method involves concentrating up to 0.5 litres of air. The concentrated aliquot is then flash vaporised and swept through a water management system to remove water vapour. Following dehumidification, the sample passes directly into the GC/MS for analysis. This method is designed to measure gaseous phase aliphatic and aromatic compounds in ambient air and soil gas collected in stainless steel Summa canisters. Eurofins Air Toxics VPH method is a hybrid of EPA TO-15 method viz chromatographic peaks were identified via mass spectrum as either aliphatic or aromatic petroleum hydrocarbons and included in the appropriate range as defined by the method. The volatile Aliphatic hydrocarbons are collectively quantified within the C5 to C6 range, C6 to C8 range, C8 to C10 range and the C10 to C12 range. Additionally, the volatile Aromatic hydrocarbons are collectively quantified within the C8 to C10 range and the C10 to C12 range. The Aromatic ranges refer to the equivalent carbon (EC) ranges. (Please note that benzene constitutes the >C5-C7 aromatic range and toluene constitutes the >C7-C8 aromatic range. Benzene and toluene concentrations are reported on the TO-15 workorder fraction.) Aliphatic data is calculated from the Total Ion Chromatogram (TIC) which has been reprocessed in a duplicate file differentiated from the original by the addition of an alphanumeric extension. The Aromatic calculation also uses the information contained in the associated extracted ion file.	**USEPA Compendium Method TO-15 Determination Of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS)**
Modified Natural Gas Analysis by ASTM D-1946*	The laboratory performed analysis via Modified ASTM Method D-1946 for Methane and fixed gases in air using	**ASTM D1946-77**

<table>
<tr><th>Analyte</th><th>Method</th><th>Reference Method</th></tr>
<tr><td></td><td>GC/FID or GC/TCD. The method involves direct injection of 1.0 mL of sample. On the analytical column employed for this analysis, Oxygen co-elutes with Argon. The corresponding peak is quantitated as Oxygen.</td><td>Standard Method for Analysis of Reformed Gas by Gas Chromatography</td></tr>
<tr><td>Analysis of volatile and semivolatile organic compounds in vapor by thermal desorption GC/MS full scan using modified EPA method TO-17,
SOP#109</td><td>The laboratory performed analysis via The laboratory performed the analysis via modified EPA Method TO-17 using GC/MS in the full scan mode. TO-17 'VI' sorbent tubes are thermally desorbed onto a secondary trap. The trap is thermally desorbed to elute the components into the GC/MS system for compound separation and detection.
A modification that may be applied to EPA Method TO-17 at the client's discretion is the requirement to transport sorbent tubes at 4 deg C. Laboratory studies demonstrate a high level of stability for VOCs on the TO-17 'VI' tube at room temperature for periods of up to 14 days. Tubes can be shipped to and from the field site at ambient conditions as long as the 14-day sample hold time is upheld. Trip blanks and field surrogate spikes are used as additional control measures to monitor recovery and background contribution during tube transport. Since the TO-17 VI application significantly extends the scope of target compounds addressed in EPA Method TO-15 and TO-17, the laboratory has implemented several method modifications outlined in the table below.
Specific project requirements may override the Eurofins Air Toxics modifications.
<table>
<tr><td>Requirement</td><td>TO-17</td><td>Eurofins Air Toxics Modifications</td></tr>
<tr><td>Initial Calibration</td><td>%RSD
≤ 30% with 2 allowed out up to 40%</td><td>VOC list:
%RSD ≤ 30% with 2 allowed out up to 40%</td></tr>
<tr><td>SVOC list: %RSD</=30 % with 2 allowed out up to 40%</td><td></td><td></td></tr>
<tr><td>Daily Calibration</td><td>%D for each target compound within ± 30%.</td><td>Fluorene, Phenanthrene, Anthracene, Fluoranthene,</td></tr>
</table></td><td>Modified EPA Method TO-17 (VI Tubes)*</td></tr>
</table>

<table>
<tr><th>Analyte</th><th colspan="3">Method</th><th>Reference Method</th></tr>
<tr><td></td><td colspan="3"><table>
<tr><td></td><td></td><td>and Pyrene within ± 40%D</td></tr>
<tr><td>Audit Accuracy</td><td>70-130%</td><td>Second source recovery limits for Fluorene, Phenanthrene, Anthracene, Fluoranthene, and Pyrene = 60-140%.</td></tr>
<tr><td>Distributed Volume Pairs</td><td>Collection of distributed volume pairs required for monitoring ambient air to insure high quality.</td><td>If site is well-characterised or performance previously verified, single tube sampling may be appropriate. Distributed pairs may be impractical for soil gas collection due to configuration and volume constraints.</td></tr>
<tr><td>Analytical Precision</td><td>≤ 20% RPD</td><td>≤ 30% RPD for Fluorene, Phenanthrene, Anthracene, Fluoranthene, and Pyrene.</td></tr>
</table></td><td></td></tr>
<tr><td>Volatile organic compounds (VOCs) - chemically desorbed with CS_2</td><td colspan="3">Code RAD130 cartridge is a stainless steel net cylinder, with 100 mesh grid opening and 5.8 mm diameter, packed with 530 ± 30 mg of activated charcoal, particle size is 35-50 mesh. Volatile organic compounds are trapped by adsorption and recovered by carbon disulfide desorption, analysis is performed by GC-MS.
white diffusive body code RAD120 
supporting plate code RAD121 
vertical adapter code RAD122 (optional) 
Chemi-adsorbing cartridge code RAD130  </td><td>Passive Sampler – radiello® User Manual 2019</td></tr>
</table>

Analyte	Method	Reference Method
	Extraction: A volume of 2.0 ml of CS_2 and 100 µL of internal standard solution is added directly in the radiello glass tube. The tube is shaken gently for 30 minutes. Sampling rates varies from the value at 298 K on the effect of temperature (in Kelvin) as expressed by the following equation: $$Q_K = Q_{298}(\frac{K}{298})$$ where Q_K is the sampling rate at the temperature K and Q_{298} is the reference value at 298 K. This produces a variation of ±5% for 10 °C variation (upwards or downwards) from 25 °C. Sampling rate is invariant with humidity in the range 15 - 90% and with wind speed between 0.1 and 10 $m.s^{-1}$. NOTE: where uptake rates (Q_K) are unpublished then they have been estimated from like compounds. Results for these compounds are semi-quantitative. Average concentration (in $\mu g.m^{-3}$) over the whole exposure time is calculated according to the following expression: $$C\ (\mu g.m^{-3}) = \frac{m\ (\mu g)}{Q_K\ (mL.min^{-1}).t(min)}.10^6$$ m = mass of analyte in µg determined by GC-MS t = exposure time in minutes	
Volatile organic compounds (VOCs) - thermally desorbed	Code RAD145 is a stainless steel net cylinder, with 3 x 8 µm mesh opening and 4.8 mm diameter, packed with 350 ± 10 mg of graphitised charcoal (Carbograph 4), particle size is 35-50 mesh. Volatile organic compounds are trapped by adsorption and recovered by thermal desorption, analysis is performed by GC-MS. yellow diffusive body code RAD1202 	**Passive Sampler – radiello® User Manual 2019**

Analyte	Method	Reference Method
	supporting plate code RAD121  vertical adapter code RAD122 (optional)  Chemi-adsorbing cartridge code RAD145  Code RAD145 cartridge has been dimensioned to fit the diameter of the Markes Unity thermal desorption system that is used in conjunction with an Agilent GC-MS. Sampling rates varies from the value at 298 K on the effect of temperature (in Kelvin) as expressed by the following equation: $$Q_K = Q_{298}(\frac{K}{298})$$ where Q_K is the sampling rate at the temperature K and Q_{298} is the reference value at 298 K. This produces a variation of ±5% for 10 °C variation (upwards or downwards) from 25 °C. Sampling rate is invariant with humidity in the range 15 - 90% and with wind speed between 0.1 and 10 $m.s^{-1}$. Do not expose directly radiello to rain: even if small amounts of water are adsorbed by Carbograph 4, they can nevertheless interfere with analysis. NOTE: where uptake rates (Q_K) are unpublished then they have been estimated from like compounds. Results for these compounds are semi-quantitative. Average concentration (in $\mu g.m^{-3}$) over the whole exposure time is calculated according to the following expression: $$C\ (\mu g.m^{-3}) = \frac{m\ (\mu g)}{Q_K\ (mL.min^{-1}).t(min)}.10^6$$ m = mass of analyte in µg determined by GC-MS t = exposure time in minutes	

Analyte	Method	Reference Method
Volatile organic compounds (VOCs) – passive samplers	Companion EPA Methods 325A (Sampler Deployment and VOC Sample Collection) and 325B (Sampler Preparation and Laboratory Analysis) select benzene as the representative compound to evaluate the overall emissions from refineries. Passive sampling onto sorbent tubes followed by Thermal Desorption-Gas-Chromatography/Mass Spectrometry (TD-GC/MS) analysis has been established as the standard air monitoring technology for the EPA's new rule. Passive sampling tube shelter assemblies will be hung at various locations along the fence line/property boundary surrounding refineries. After two weeks (14 days) passive sampling tubes can be detached from their shelters, re-sealed and sent to a laboratory equipped with TD-GC/MS for analysis. Per EPA Method 325, all tubes must be replaced with freshly conditioned and qualified sampling tubes every 14 days to ensure continuous monitoring. The methods provide a low cost alternative to screen fugitive or area emissions as compared to active sampling methods that involve pumped sorbent tubes or time weighted average canister sampling. While the rule is currently limited to the monitoring of benzene, Method 325 can also be extended to include other compounds of concern at ambient monitoring sites. Additional target VOCs include 1,3-Butadiene, Toluene, Ethyl Benzene, and Xylenes as well as other chemicals for which diffusive sampling rates have been determined. Reporting limits less than 1 µg/m^3 can be easily achieved over a 7-day period. Extending the sampling period to 14 days translates to reporting limits less than 0.5 µg/m^3.	**US EPAMethod 325B— Volatile Organic Compounds from Fugitive and Area Sources:** **Sampler Preparation and Analysis**

Table 3: PFAS LORs - Water, Soil/Sediments & Biotic Matrices

Per- and Polyfluoroalkyl Substances (PFASs)	CAS No.[a]	MW	WATER (Potable, surface, groundwater, saline		SOLIDS (Soil, sediment, biosolids)		BIOTA*			
			LOR (µg/L)	LOR Trace (µg/L)	LOR (µg/kg)	LOR Trace (µg/kg)	Type 1 LOR (ng/mL)	Type 2 LOR (µg/kg)	Type 3 LOR (µg/kg)	Type 2 Trace LOR (µg/kg)
Perfluoroalkyl carboxylic acids (PFCAs)										
Perfluorobutanoic acid (PFBA)	375-22-4	214.04	0.05	0.005	5	0.1	0.5	0.5	1	0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	264.05	0.01	0.001	5	0.1	0.5	0.5	1	0.1
Perfluorohexanoic acid (PFHxA)	307-24-4	314.05	0.01	0.001	5	0.1	0.5	0.5	1	0.1
Perfluoroheptanoic acid (PFHpA)	375-85-9	364.06	0.01	0.001	5	0.1	0.5	0.5	1	0.1
Perfluorooctanoic acid (PFOA)	335-67-1	414.07	0.01	0.001	5	0.1	0.5	0.5	1	0.1
Perfluorononanoic acid (PFNA)	375-95-1	464.08	0.01	0.001	5	0.1	0.5	0.5	1	0.1
Perfluorodecanoic acid (PFDA)	335-76-2	514.08	0.01	0.001	5	0.1	0.5	0.5	1	0.5
Perfluoroundecanoic acid (PFUnA)	2058-94-8	564.09	0.01	0.001	5	0.1	0.5	0.5	1	0.5
Perfluorododecanoic acid (PFDoA)	307-55-1	614.10	0.01	0.001	5	0.1	0.5	0.5	1	0.5
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	664.11	0.01	0.001	5	0.1	0.5	0.5	1	0.5
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	714.11	0.01	0.001	5	0.1	0.5	0.5	1	0.5
Perfluoroalkyl sulfonic acids (PFSAs)										
Perfluoropropanesulfonic acid (PFPrS)	423-41-6	250.09	0.01	0.001	5	0.1	0.5	0.5	1	0.1
Perfluorobutanesulfonic acid (PFBS)	375-73-5	300.10	0.01	0.001	5	0.1	0.5	0.5	1	0.1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	350.11	0.01	0.001	5	0.1	0.5	0.5	1	0.1
Perfluorohexane sulfonate (PFHxS)	355-46-4	400.11	0.01	0.001	5	0.1	0.5	0.5	1	0.1
Potassium perfluorohexanesulfonate (linear and branched isomers) (br-PFHxS)			0.01	0.001	5	0.1	0.5	0.5	1	0.1
Perfluoroheptane sulfonate (PFHpS)	375-92-8	450.12	0.01	0.001	5	0.1	0.5	0.5	1	0.1
Perfluorooctane sulfonic acid (PFOS)[g ,h]	1763-23-1	500.13	0.01	0.001	5	0.1	0.5	0.5	1	0.1
Potassium perfluorooctanesulfonate (linear and branched isomers) (br-PFOS)			0.01	0.001	5	0.1	0.5	0.5	1	0.1

Per- and Polyfluoroalkyl Substances (PFASs)	CAS No.[a]	MW	WATER (Potable, surface, groundwater, saline		SOLIDS (Soil, sediment, biosolids)		BIOTA*			
			LOR (µg/L)	LOR Trace (µg/L)	LOR (µg/kg)	LOR Trace (µg/kg)	Type 1 LOR (ng/mL)	Type 2 LOR (µg/kg)	Type 3 LOR (µg/kg)	Type 2 Trace LOR (µg/kg)
Perfluorononanesulfonic acid (PFNS)	68259-12-1	550.13	0.01	0.001	5	0.1	0.5	0.5	1	0.1
Perfluorodecanesulfonic acid (PFDS)	67906-42-7	617.18	0.01	0.001	5	0.1	0.5	0.5	1	0.1
Perfluoroalkane sulfonamides (FASAs), Perfluoroalkane sulfonamido ethanols (FASEs) and N-alkyl perfluoroalkane sulfonamido ethanols (MeFASEs, EtFASEs) Perfluoroalkane sulfonamido acetic acids (FASAAs) and N-alkyl perfluoroalkane sulfonamido acetic acids (MeFASAAs, EtFASAAs)										
Perfluorooctane sulfonamide (FOSA)	754-91-6	499.14	0.05	0.005	10	1	5	0.5	5	0.5
N-Methylperfluorooctane sulfonamide (MeFOSA)	31506-32-8	513.17	0.05	0.005	10	1	5	0.5	5	0.5
N-Ethylperfluorooctane sulfonamide (EtFOSA)	4151-50-2	527.19	0.05	0.005	10	1	5	2	5	0.5
N-Methylperfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	557.22	0.05	0.005	10	1	5	1	5	0.5
N-Ethylperfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	571.25	0.05	0.005	10	1	5	1	5	0.5
N-Ethylperfluorooctanesulfonamido acetic acid (EtFOSAA)	2991-50-6	585.23	0.05	0.005	10	1	5	0.5	5	0.5
N-Methylperfluorooctanesulfonamido acetic acid (N-MeFOSAA)	2355-31-9	571.21	0.05	0.005	10	1	5	0.5	5	0.5
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)										
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2 FTSA)	757124-72-4	328.15	0.01	0.001	5	0.5	5	0.5	5	0.1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2 FTSA)	27619-97-2	428.16	0.01	0.001	5	0.5	5	0.5	5	0.1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2 FTSA)	39108-34-4	528.18	0.01	0.001	5	0.5	5	1	5	0.1
1H, 1H, 2H, 2H-perfluorododecane sulfonate (10:2 FTSA)	120226-60-0	628.20	0.01	0.001	5	0.5	5	1	5	0.5
Additional PFAS Compounds										
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX)	13252-13-6[b]	285[f]	0.01		5					
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF_3OUdS) [11Cl-F53B]	763051-92-9[c]	631	0.01		5					
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF_3ONS) [9Cl-F53B]	756426-58-1[d]	531	0.01		5					
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4[e]	377	0.01		5					

Per- and Polyfluoroalkyl Substances (PFASs)	CAS No.[a]	MW	WATER (Potable, surface, groundwater, saline		SOLIDS (Soil, sediment, biosolids)		BIOTA*			
			LOR (µg/L)	LOR Trace (µg/L)	LOR (µg/kg)	LOR Trace (µg/kg)	Type 1 LOR (ng/mL)	Type 2 LOR (µg/kg)	Type 3 LOR (µg/kg)	Type 2 Trace LOR (µg/kg)
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	151772-58-6	296.045	0.01		5					
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	113507-82-7	316.09	0.01		5					
Perfluoro-3-methoxypropanoic acid (PFMPA)	377-73-1	230.038	0.01		5					
Perfluoro-4-methoxybutanoic acid (PFMBA)	863090-89-5	280.046	0.01		5					
6:2 fluorotelomer sulfonamide alkylbetaine (6:2 FTAB)[i]	34455-29-3	570.37	0.01		5					
3:3 Fluorotelomercarboxylic acid (3:3 FTCA)	356-02-5	242.093	0.01		5					
5:3 Fluorotelomer carboxylic acid (5:3 FTCA)	914637-49-3	342.108	0.01		5					
Perfluoropropane sulfonic acid (PFPrS)	423-41-6	248.90	0.01		5					
Perfluoroethylcyclohexane sulfonate (PFECHS)	67584-42-3	500.22	0.01		5					

[a] Some PFAS are commercially available as ammonium, sodium and potassium salts. This method measures all forms of the analytes as anions while the counterion is inconsequential. Analytes may be purchased as acids or as any of the corresponding salts (see Section 7.2.3 regarding correcting the analyte concentration for the salt content).
[b] HFPO-DA is one component of the GenX processing aid technology.
[c] 11Cl-PF_3OUdS is available in salt form (e.g. CASRN of potassium salt is 83329-89-9).
[d] 9Cl-PF_3ONS analyte is available in salt form (e.g. CASRN of potassium salt is 73606-19-6)
[e] ADONA is available as the sodium salt (no CASRN) and the ammonium salt (CASRN is 958445-448).
[f] HFPO-DA is not stable in the ESI source and the [M-H]- is not observed under typical ESI conditions. The precursor ion used during method development was [M-CO2]-.
[g] Analyte has multiple resolved chromatographic peaks due to linear and branched isomers. All peaks summed for quantitation purposes.
[h] To reduce bias regarding detection of branched and linear isomers, the m/z 80 product ion must be used for this analyte.
[i] NICNAS 6:2 Fluorotelomer sulfonamide surfactants: Environment tier II assessment 12 December 2019

BIOTA Key
Type 1 - Human and Animal Blood (whole blood & plasma)
Type 2 - Citrus, tomato, zucchini, grasses, squash; muscle tissue of fish, crustaceans, cheese, cow, sheep; kidney tissue of sheep and cow; milk and chicken egg
Type 3 - Sheep and cow liver; olives and avocado

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Recommended Holding Times and Preservations for Soil and Air

APPLICABLE LOCATIONS

The bottles, preservation and holding times following are for the ALS Environmental operations excluding the ALS Water Resources Group (WRG). The ALS operations covered by this document include;

Adelaide
Unit 2, 1 Burma Road
Pooraka, Adelaide, SA 5095
P +6- 8-8162-5130
ALSEnviro.Adelaide@alsglobal.com

Brisbane
2 Byth Street (Corner Byth and Shand St)
Stafford QLD 4053
P +61-7-3243-7222
ALSEnviro.Brisbane@alsglobal.com

Darwin
4/16 Charlton Court
Woolner, NT 0820
P +61-488-073-271
ALSEnviro.Darwin@alsglobal.com

Gladstone
46 Callemondah Drive
Clinton Gladstone, QLD 4680
P +61-7-4971-5600
ALSEnviro.Gladstone@alsglobal.com

Mackay
78 Harbour Road
Mackay, QLD 4740
P +61-7-4944-0177
ALSEnviro.Mackay@alsglobal.com

Melbourne
2-4 Westall Road
Springvale VIC 3171
P +61-3-8549-9600
ALSEnviro.Melbourne@alsglobal.com

Mudgee
29 Sydney Road
Mudgee NSW 2850
P +61-2-6372-6735
ALSEnviro.Mudgee@alsglobal.com

Newcastle
5 Rosegum Road
Warabrook NSW 2304
P +61-2-4968-9433
ALSEnviro.Newcastle@alsglobal.com

Nowra
4/13 Geary Place
North Nowra NSW 2541
P +61-2-4423-2063
ALSEnviro.Nowra@alsglobal.com

Perth
10 Hod Way
Malaga WA 6090
P +61-8-9209-7655
ALSEnviro.Perth@alsglobal.com

Roma
Lot 4, 73 Beaumont Drive
Roma QLD 4455
P +61-7-4622-8978
ALSEnviro.Roma@alsglobal.com

Sydney
277-289 Woodpark Road
Smithfield NSW 2164
P +61-2-8784-8555
ALSEnviro.Sydney@alsglobal.com

Townsville
14-15 Desma Court
Bohle, QLD 4818
P +61-7-4796-0600
ALSEnviro.Townsville@alsglobal.com

Wollongong
99 Kenny Street
Wollongong NSW 2500
P +61-2-4225-3125
ALSEnviro.Wollongong@alsglobal.com

SOIL AND SEDIMENT SAMPLE CHILLING AND SUBMISSION

Most soils should be chilled to <4˚C or <6˚C (guideline dependent) and transported to the laboratory within 24 hours. Sediments may also benefit from being frozen. ALS recommends placing samples on ice immediately upon sampling for best practice chilling with either repacking into another esky or draining of free water and replacement of ice just prior to dispatch. Chilling overnight in a fridge may also benefit. The post-chilling addition of ice bricks is also recommended where samples are air freighted or dispatched long distance and where couriers will not freight ice.

Please note that where possible samples should be submitted to the laboratory with at least half the recommended holding time remaining and it is preferable to avoid submitting holding time critical tests and full VOC suites late on Fridays without prior arrangement.

GENERAL NOTES

The following soil testing services are centralized in specialist laboratory locations. These tests require additional separate jars or bags to optimize service delivery and holding time compliance;

- Dioxins, Total S, TOC, TBT (Brisbane),
- PFOS/PFOA/AFFFs, PBDEs, Explosives, Herbicides, Pesticides and Ultra trace Organics (Sydney).
- Sizings, Asbestos and Foreign Materials Testing (Newcastle);
- TRH Speciation (Perth and Melbourne),
- ASS/AMD (Perth and Brisbane).

KEY			
G	Glass	**G(T)**	Glass Jar with Teflon Lined Lid
(ZH)	Zero Headspace required	**PB**	Plastic (Polyethylene) Bag
HVAS	High Volume Air Sampler Paper	**PTFE**	Polytetrafluoroethylene Filter
PUF	Polyurethane Filter	**P**	Plastic Container

Recommended Holding Times and Preservations for Soil and Air

SOIL SAMPLES

Parameter		ALS Preferred Container	Preservation	Holding Time	Reference
INORGANICS, METALS, RADIONUCLIDES, ACID SULFATE SOILS AND PHYSICAL PARAMETERS					
General Anions and Cations: Chloride, Bromide, Fluoride, Sulfate, CEC & exchangeable Cations		PB, P or G	Chill, preferably to <6˚C	28 days [4]	NEPM 2013
Asbestos		PB (double bagged)	Nil	Indefinite	AS4964-2004
Cyanide		P or G	Chill, Store in dark	14 days [4]	NEPM 2013
Electrical conductivity		PB, P or G	Chill, preferably to <6˚C	7 days [4]	NEPM 2013
Gross alpha, Gross beta		PB, P or G	Nil	180 days	ISO9696, ISO9697, ASTM D7283-06.
Hexavalent Chromium (Alkali extract)		P or G	Chill, Store in dark	28 days (plus 7 for extract)	NEPM 2013
Metals - General		PB, P or G	Nil	6 months	NEPM 2013
Mercury		P or G	Chill, Store in dark	28 days	NEPM 2013
Methyl Mercury	Option 1	G(T)	Chill, Store in dark	40 days	Horvat et al, 1993
	Option 2	G(T)	Freeze, Store in dark	8 months	Horvat et al, 1993
Moisture Content		PB, P or G	Chill, preferably to <6˚C	14 days	NEPM 2013
Organic Carbon / TOC	Option 1	G	Chill, to <6˚C store in dark	28 days	NEPM 2013
	Option 2	G	Freeze for sediments	6 months	NAGD 2009
pH		PB, P or G	Chill, preferably to <6˚C	7 days	NEPM 2013
Radium 226, 228		PB or G	Nil	180 days	ISO10703, ASTM D7283-06.
SPOCAS, TOS, Chromium Suite	Option 1	PB (exclude air)	Freeze	Indefinite	AS4969.1-2008
	Option 2		Chill, preferably to <6˚C	24 hours	
	Option 3		Dry at 80˚C	Indefinite	
Sizings and Foreign Material Tests		PB or G	Nil for sediments	Indefinite	NAGD 2009
Sulfur - total		PB or G	Chill, preferably to <6˚C	7 days (6 months once prepared)	NEPM 2013 plus in house
Sulfide		PB or G	Chill, preferably to <6˚C	28 days (if Total S hold' time met)	NEPM 2013 plus in house
ORGANICS - SEMIVOLATILE COMPOUNDS (SVOCS)					
General less persistent Semi-Volatile Organic chemicals including: • Carbamate Pesticides • Explosive residues • OC, OP Pesticides & PCBs • Phenoxy acid Herbicides • General Herbicides • TRH/TPH (C_{10}-C_{40}), • PAHs and Phenols • Phthalate Esters • Pyrethroids (Synthetic) • Semi Volatile Chlorinated Compound • Tributyl Tin (TBT)		G(T)	Place immediately in the esky and chill to <6˚C using ice. Avoid exposure to light	14 days (plus holding of extracts typically for up to 40 days)	NEPM 2013
Dioxins & Furans & PCBs		G(T)		1 year in dark, freeze to -10^{0}C	USEPA 1613
PBDEs		G(T)		1 year in dark, freeze to -10^{0}C	USEPA 1614
PFOS & PFOA/ 6:2-FtS / AFFFs		G(T)		6 months	In house - POPs
Tributyl Tin, OCPs, OPPs, Phenols, PAHs and PCBs		G(T)	Freeze within 12 hours of sampling for sediments	56 days (plus 40 days for extracts)	NAGD 2009
ORGANICS - VOLATILE COMPOUNDS (VOCS)					
VOCs *except* vinyl chloride, styrene and/or 2-chloroethyl vinyl ether		G(T)	Rapidly sample, minimize headspace and Chill to <6˚C. Avoid exposure to light	14 days	NEPM 2013
Vinyl chloride and styrene		G(T)		**7 days** ***(Previously 14 days under NEPM 1999)***	NEPM 2013

AMBIENT AIR, SOIL GAS AND OCCUPATIONAL HYGIENE

ORGANICS - VOLATILE AND SEMIVOLATILE COMPOUNDS

Parameter	Media	Preservation	Holding Time	Reference
VOCs in whole air samples	Silonite Canister	Nil	30 days	USEPA TO15r
VOCs on Sorbents	Charcoal Tubes/ Passive Badge	Nil	30 Days	NIOSH 1500/1501/1003
Semi-Volatile Organics including: PAHs Chlorinated Benzenes Chlorinated Phenols	XAD-2 Resin	Protect from light. Store in the dark submit as soon as possible	7-14 Days	USEPA TO4A/TO10A/TO13A NIOSH 5515/5517
	PTFE/GFF/MCE Filters		7 Days	NIOSH 5515/5517
	PUF		7 Days	USEPA TO4A/TO13A
	HVAS		7 Days	USEPA TO4A/TO13A

NOTES

1. Samples for ZHE TCLP or ASLP require a separate additional jar.
2. TCLP and other leaching procedures need to be conducted within the solid sample holding time of the analyte of interest.
3. When a moisture determination is used for dry weight basis reporting, no holding time applies when performed on the same day as the chemical analytes of interest.
4. Holding times for extracted parameters (e.g. Chloride, Bromide, EC, Sulfate, Sulfide & Cyanide) are until extraction. Extract solution holding times also apply.

ALS RECOMMENDED HOLDING TIMES AND PRESERVATIONS FOR WATER

Version 2 January 2013

APPLICABLE LOCATIONS

The bottles, preservation and holding times following are for the ALS Environmental operations excluding the ALS Water Resources Group Victoria and ACT operations (WRG). The ALS operations covered by this document include;

Adelaide
Unit 2, 1 Burma Road
Pooraka, Adelaide, SA 5095
Phone: 61-8-8162 5130
Email: ALSEnviro.Adelaide@alsglobal.com

Brisbane
2 Byth Street (Corner Byth and Shand St)
Stafford QLD 4053
Phone: 61-7-3243 7222
Email: ALSEnviro.Brisbane@alsglobal.com

Darwin
4/16 Charlton Court
Woolner, NT 0820
Phone: 61-488 073 271
Email: ALSEnviro.Darwin@alsglobal.com

Gladstone
48 Callemondah Drive
Clinton Gladstone, QLD 4680
Phone: 61-7-4971 5600
Email: ALSEnviro.Gladstone@alsglobal.com

Mackay
78 Harbour Road
Mackay, QLD 4740
Phone: 61-7-4944 0177
Email: ALSEnviro.Mackay@alsglobal.com

Melbourne
2 - 4 Westall Road
Springvale VIC 3171
Phone: 61-3-8549 9600
Email: ALSEnviro.Melbourne@alsglobal.com

Mudgee
29 Sydney Road
Mudgee NSW 2850
Phone: 61-2-6372 6735
Email: ALSEnviro.Mudgee@alsglobal.com

Newcastle
5 Rosegum Close
Warabrook NSW 2304
Phone: 61-2-4968 9433
Email: ALSEnviro.Newcastle@alsglobal.com

Nowra
4/13 Geary Place
North Nowra NSW 2541
Phone: 61-2-4423 2063
ALSEnviro.Nowra@alsglobal.com

Perth
10 Hod Way
Malaga WA 6090
Phone: 61-8-9209 7655
Email: ALSEnviro.Perth@alsglobal.com

Roma
Lot 4, 73 Beaumont Drive
Roma QLD 4455
Phone: 61-7-4622 8978
Email: ALSEnviro.Roma@alsglobal.com

Sydney
277-289 Woodpark Road
Smithfield NSW 2164
Phone: 61-2-8784 8555
Email: ALSEnviro.Sydney@alsglobal.com

Townsville
14-15 Desma Court
Bohle, QLD 4818
Phone: 61-7-4796 0600
Email: ALSEnviro.Townsville@alsglobal.com

Wollongong
99 Kenny Street
Wollongong NSW 2500
Phone : 61-2-4225 3125
Email: ALSEnviro.Wollongong@alsglobal.com

SAMPLE PRESERVATION, CHILLING AND SUBMISSION

Care must be taken not to rinse out or spill preservatives during sampling for OH&S reasons and to avoid cross contaminating other bottles (e.g. Nitric acid used for metals can contaminate nitrate analysis). Field filtration is mandatory or recommended for many tests and other tests must have exposure to air minimized to avoid analyte losses. Samples should generally be chilled to <4ºC or <6ºC (guideline dependent) and transported to the laboratory within 24 hours. ALS recommends placing samples in ice immediately upon sampling for best practice chilling with either repacking into another esky or draining of free water and replacement of ice just prior to dispatch. Chilling overnight in a fridge may also benefit. The post-chilling addition of ice bricks is also recommended where samples are air freighted or dispatched long distance and where couriers will not freight ice.

Samples taken from chlorinated water sources require the addition of sodium thiosulfate for microbiological, volatile organics and semi volatile organics. Please advise ALS accordingly to facilitate supply of appropriate containers.

Please note that where possible samples should be submitted to the laboratory with at least half the recommended holding time remaining and it is preferable to avoid submitting holding time critical tests late on Fridays without prior arrangement.

ALS RECOMMENDED HOLDING TIMES AND PRESERVATIONS FOR WATER

Parameter		Container	Preservation	Holding Time	Reference
GENERAL INORGANICS (METALS, NUTRIENTS, CATIONS, ANIONS, PHYSICAL TESTS)					
Acidity / Alkalinity		P	Chill	14 days	APHA Table 1060:I
Ammonia Nitrogen	Option 1	P	H_2SO_4 to pH<2, Chill	28 days	APHA Table 1060:I
	Option 2	P	Chill	1 day	APHA Table 1060:I
Anions General: Chloride, Sulfate, Fluoride, Bromide		P	Chill	28 days	APHA Table 1060:I
BOD		P	Chill	2 days	APHA Table 1060:I
Cations & Hardness: (Calcium, Magnesium, Sodium, Potassium)	Option 1	P	HNO_3 to pH<2, Chill	28 days (All)	AS/NZS 5667.1:1998
	Option 2	P	Nil, Chill	7 days (Ca, Mg, Hardness) 28 days (Na, K)	AS/NZS 5667.1:1998
Carbon Total Organic (TOC)		G	H_2SO_4 to pH<2, Chill	28 days	APHA Table 1060:I
Carbon Dissolved Organic (DOC)		G	H_2SO_4 to pH<2, Field filter[2], Chill	28 days	APHA Table 1060:I
Chlorophyll a		P - Opaque	Chill, Store in dark (filter, store filtrate frozen in foil)	2 days 28 days	APHA Table 1060:I
Chromium VI		P	NaOH, Chill	28 days	USEPA 1669
COD		P	H_2SO_4 to pH<2, Chill	28 days	APHA Table 1060:I
Colour		P	Chill	2 days	APHA Table 1060:I
Conductivity (EC)		P	Chill	28 days	APHA Table 1060:I
Cyanide		P - Opaque	NaOH to pH>12, Chill [1]	14 days	APHA 1060:I
Ferrous (Fe^{2+})		P (A)	HCl to pH<2. (ZH), Field filter[2], Chill	7 days	ISO 5667-3:2003
Formaldehyde		P	Chill	2 days	ASTM D6303-98
Mercury	Option 1	P (A)	HNO_3 to pH<2, Chill [2]	28 days	APHA Table 1060:I
	Option 2	P (A)	Nil – Lab Acidify in <14 days, Chill [2]	28 days	USEPA 200.8
Metals General	Option 1	P (A)	HNO_3 to pH<2, Chill [2]	6 months	APHA Table 1060:I
	Option 2	P (A)	Nil - Lab Acidify in <14 days, Chill [2]	6 months	USEPA 200.8
Nitrate Nitrogen		P	Chill	2 days	APHA Table 1060:I
Nitrite Nitrogen		P	Chill	2 days	APHA Table 1060:I
Nitrogen - Oxidised Nitrogen (NOx)		P	H_2SO_4 to pH<2, Chill	28 days	APHA Table 1060:I/ AS/NZS 5667.1:1998
			Chill	2 days	
Nitrogen and Phosphorous - Total (Persulfate Method)		P	Nil, Chill	1 day	AS/ NZS 5667.1:1998
Nitrogen - Total		P	H_2SO_4 to pH<2, Chill	28 days	APHA Table 1060:I
Oil & Grease		G	$NaHSO_4$ or H_2SO_4 to pH<2,Chill	28 days	APHA Table 1060:I
Perchlorate		P	Filter, Chill, Store in dark	28 days	USEPA 6850
pH		P	Nil	6 hours	AS/NZS 5667.1:1998
Phenols - Total		P, G	H_2SO_4 to pH<2, Chill	28 days	APHA Table 1060:I
Phosphorus - Reactive		P	Nil, Chill	2 days	APHA Table 1060:I
Phosphorus - Total		P	H_2SO_4 to pH<2, Chill	28 days	AS/NZS 5667.1:1998
Radionuclides incl' Gross alpha, Gross beta & Radium 226, 228		P, G	Lab Acidify in <5 days, Chill or HNO_3 to pH<2, Chill	6 months	APHA 7010B
Solids (TS, TSS, TDS)		P	Chill	7 days	APHA Table 1060:I
Surfactants (NIS, MBAS)		G	Chill	2 days	AS/NZS 5667.1:1998
			Chill, submit in 2 days, preserve in Lab	4 days (MBAS) 28 days (NIS)	
Silica		P	Chill	28 days	APHA Table 1060:I
Sulfide		P	Zn Acetate/NaOH, Chill	7 days	AS/NZS 5667.1:1998
Sulfite		P	EDTA/Zn Acetate, Chill	2 days	AS/NZS 5667.1:1998
Speciated Arsenic and Selenium		P (A)	HCl to pH<2, Chill, (Zero Headspace)	28 days	USEPA1632-2001
Thiocyanate		P	HNO_3 to pH<2, Chill	6 months	APHA 4500CN M
TKN (Total Kjeldahl Nitrogen)		P	H_2SO_4 to pH<2, Chill	28 days	APHA Table 1060:I
Turbidity		P	Store in dark, Chill	2 days	APHA Table 1060:I
ALGAE AND MICROBIOLOGICAL TESTS					
Algae Analysis	Option 1	P	Lugols at 1% v/v ratio	6 months	Hotzel and Croome 1999
	Option 2	P	Nil	48 hours	Hotzel and Croome 1999
General Microbiological Tests (e.g. Faecal coliforms, E-coli, HPC etc)		P (sterile)	$Na_2S_2O_3$,(if chlorinated)/ Chill	1 day	APHA 9060B

NOTES

[1] When samples are suspected of containing Sulfide, a Sulfide Pre-treatment bottle (containing Lead Acetate) should be used to remove Sulfide prior to decanting into the 'Cyanide' bottle.

[2] Dissolved Metals, Ferrous Iron and DOC should be field filtered using a 0.45µm filter prior to placing in the container.

KEY			
G	Glass	Amber (T)	Amber Glass Bottle with Teflon Lined Lid
P (A)	Plastic (verified metal free)	P	Plastic (Polyethylene)
(TS)	40mL Vial with Teflon Lined Septum	(ZH)	Zero Headspace required

ALS RECOMMENDED HOLDING TIMES AND PRESERVATIONS FOR WATER

ORGANICS - SEMIVOLATILE COMPOUNDS (SVOCS)				
Parameter	**Container**	**Preservation**	**Holding Time**	**Reference**
Acrylamide	Amber (T)	Chill	7 days	USEPA SW846 8316 1998
Alkyl phenol Ethoxylates	Amber (T)	Chill	2 days	AS/NZS 5667.1:1998
		Chill, submit in 2 days, preserve in Lab	7 days	In house
Carbamates	Amber (T)	Chill	7 days (3)	USEPA 632
Chlorinated Hydrocarbons (SV)	Amber (T)	Chill	7 days (3)	USEPA SW846 2007
Dioxins	Amber (T)	Chill	1 year	USEPA 1613.B
Explosives	Amber (T)	Chill	7 days (3)	USEPA SW846 2007
Glyphosate	Amber (T)	Chill	14 days (3)	USEPA 547
Glycols	Vial (TS)	Chill	7 days (3)	USEPA SW846 2007
Herbicides (Phenoxy Acid)	Amber (T)	Chill	7 days (3)	USEPA SW846 2007
N-Nitrosodimethylamine (NDMA)	Amber (T)	Chill	7 days (3)	USEPA 607
Organochlorine Pesticides & PCBs	Amber (T)	Chill	7 days (3)	USEPA SW846 2007
Organophosphorus Pesticides	Amber (T)	Chill	7 days (3)	USEPA SW846 2007
Paraquat/Diquat	P	Chill	7 days (3)	USEPA SW846 2007
Petroleum Hydrocarbons (C_{10}-C_{40})	Amber (T)	Chill	7 days (3)	USEPA SW846 2007
Phenols and Phthalate Esters	Amber (T)	Chill	7 days (3)	USEPA SW846 2007
PFOS & PFOA/ 6:2-FTS and AFFFs	P (PTFE free)	Chill	6 months	In house - POPs
Polyaromatic Hydrocarbons (PAHs)	Amber (T)	Chill	7 days (3)	USEPA SW846 2007
PPCPs	Amber (T)	Nil	7 days (3)	AGWR 2008, USEPA 1694
Synthetic Pyrethroids	Amber (T)	Chill	7 days (3)	USEPA SW846-8270D
Tributyl Tin (TBT)	Amber (T)	Chill	7 days (3)	USEPA SW846 2007
ORGANICS - VOLATILE COMPOUNDS (VOCS) / DISSOLVED GASES				
Parameter	**Container**	**Preservation**	**Holding Time**	**Reference**
BTEXN plus TRH/TPH Hydrocarbons (C_6-C_{10})	Vial (TS)	H_2SO_4 or $NaHSO_4$ to pH<2, Chill, (ZH)	14 days	USEPA SW846 2007
C_1-C_4 Gases (including Methane)	Vial (TS)	H_2SO_4 or $NaHSO_4$ to pH<2, Chill, (ZH)	14 days	USEPA SW846 2007/ NATATTEN.WPD 2002
Chloroacetic Acids	Vial (TS)	NH_4Cl, Chill, (ZH)	28 days	USEPA 552.1
Acrylonitrile, 1,4-Dioxane, Pyridine	Vial (TS)	H_2SO_4 or $NaHSO_4$ to pH<2, Chill, (ZH)	14 days	USEPA 603, 1671 & 524.2, USEPA SW846 2007
Acrolein	Vial (TS)	Chill, (ZH)	3 days	USEPA 603
		Chill, submit in 3 days, preserve in Lab	14 days	
Halo Acetic Acids	Vial (TS)	NH_4Cl, Chill, (ZH)	28 days	USEPA 552.1
MIB/Geosmin	Vial (TS)	Chill, (ZH)	3 days	APHA 6040
		Chill, submit in 3 days, preserve in Lab	7 days	
VOCs including: Halogenated Aliphatics, Aromatics, Monocyclic Aromatics (MAHs), Trihalomethanes (THMs) and Alcohols	Vial (TS)	H_2SO_4 or $NaHSO_4$ to pH<2, Chill, (ZH)	14 days	USEPA SW846 2007

KEY			
G	Glass	Amber (T)	Amber Glass Bottle with Teflon Lined Lid
P (A)	Plastic (verified metal free)	P	Plastic (Polyethylene)
(TS)	40mL Vial with Teflon Lined Septum	(ZH)	Zero Headspace required

NOTES

(3) Samples can also be extracted within 7 days and the resulting extracts analysed within 40 days.

APPENDIX N

LABORATORY CERTIFICATES

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2132020**	Page	: 1 of 5
Client	: **AARGUS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: CYNTHIA	Contact	: Customer Services ES
Address	: PO BOX 398 DRUMMOYNE NSW, AUSTRALIA 2047	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 1300137038	Telephone	: +61-2-8784 8555
Project	: ES8338 DSI	Date Samples Received	: 03-Sep-2021 08:50
Order number	: ----	Date Analysis Commenced	: 06-Sep-2021
C-O-C number	: ----	Issue Date	: 08-Sep-2021 16:24
Sampler	: SBS		
Site	: GREENACRE		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

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*
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

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.

- EP132-LL: Where reported, Total PAH is the sum of the reported concentrations of all PAHs 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.
- EP132-LL : Positive PAH result is confirmed by re-analysis.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	GWSS1	----	----	----	----
				Sampling date / time	02-Sep-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2132020-001	--------	--------	--------	--------
					Result	----	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		**0.002**	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		**0.0001**	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		**0.003**	----	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.006**	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		<100	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ **Total Xylenes**	----	2	µg/L		<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	GWSS1	----	----	----	----
				Sampling date / time	02-Sep-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2132020-001	--------	--------	--------	--------
					Result	----	----	----	----
EP132B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.02	µg/L		**0.04**	----	----	----	----
Acenaphthylene	208-96-8	0.02	µg/L		<0.02	----	----	----	----
Acenaphthene	83-32-9	0.02	µg/L		<0.02	----	----	----	----
Fluorene	86-73-7	0.02	µg/L		<0.02	----	----	----	----
Phenanthrene	85-01-8	0.02	µg/L		**0.06**	----	----	----	----
Anthracene	120-12-7	0.02	µg/L		<0.02	----	----	----	----
Fluoranthene	206-44-0	0.02	µg/L		<0.02	----	----	----	----
Pyrene	129-00-0	0.02	µg/L		<0.02	----	----	----	----
Benz(a)anthracene	56-55-3	0.02	µg/L		<0.02	----	----	----	----
Chrysene	218-01-9	0.02	µg/L		<0.02	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.02	µg/L		<0.02	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.02	µg/L		<0.02	----	----	----	----
Benzo(a)pyrene	50-32-8	0.005	µg/L		<0.005	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.02	µg/L		<0.02	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.02	µg/L		<0.02	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.02	µg/L		<0.02	----	----	----	----
^ **Total PAH**	----	0.005	µg/L		**0.100**	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.005	µg/L		<0.005	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**105**	----	----	----	----
Toluene-D8	2037-26-5	2	%		**116**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**113**	----	----	----	----
EP132T: Base/Neutral Extractable Surrogates (Low-Level)									
2-Fluorobiphenyl	321-60-8	0.02	%		**85.2**	----	----	----	----
Anthracene-d10	1719-06-8	0.02	%		**114**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.02	%		**110**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
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
EP132T: Base/Neutral Extractable Surrogates (Low-Level)			
2-Fluorobiphenyl	321-60-8	54	136
Anthracene-d10	1719-06-8	66	134
4-Terphenyl-d14	1718-51-0	63	135

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES2132020**	Page	: 1 of 6
Client	: **AARGUS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: CYNTHIA	Contact	: Customer Services ES
Address	: PO BOX 398 DRUMMOYNE NSW, AUSTRALIA 2047	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 1300137038	Telephone	: +61-2-8784 8555
Project	: ES8338 DSI	Date Samples Received	: 03-Sep-2021
Order number	: ----	Date Analysis Commenced	: 06-Sep-2021
C-O-C number	: ----	Issue Date	: 08-Sep-2021
Sampler	: SBS		
Site	: GREENACRE		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

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*
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

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.

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 3884565)									
ES2131988-013	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.217	0.216	0.0	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.040	0.040	0.0	No Limit
WN2109994-005	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.104	0.102	2.0	0% - 20%
EG035F: Dissolved Mercury by FIMS (QC Lot: 3884566)									
WN2109994-005	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3886466)									
ES2131927-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2132080-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	40	40	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3886466)									
ES2131927-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2132080-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	40	40	0.0	No Limit
EP080: BTEXN (QC Lot: 3886466)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080: BTEXN (QC Lot: 3886466) - continued									
ES2131927-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2132080-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control 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**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 3884565)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	92.1	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	89.9	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	86.6	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	89.9	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	90.2	83.0	111
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	88.2	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	93.3	81.0	117
EG035F: Dissolved Mercury by FIMS (QCLot: 3884566)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	95.7	83.0	105
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3885108)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	82.9	55.8	112
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	86.3	71.6	113
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	81.9	56.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3886466)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	87.1	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3885108)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	74.1	57.9	119
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	86.0	62.5	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	63.8	61.5	121
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3886466)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	88.0	75.0	127
EP080: BTEXN (QCLot: 3886466)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	84.0	70.0	122
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	93.4	69.0	123
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	90.8	70.0	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	91.8	69.0	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	94.4	72.0	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	93.1	70.0	120
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3883947)								
EP132-LL: Naphthalene	91-20-3	0.02	µg/L	<0.02	0.25 µg/L	107	62.0	136
EP132-LL: Acenaphthylene	208-96-8	0.02	µg/L	<0.02	0.25 µg/L	113	68.0	128
EP132-LL: Acenaphthene	83-32-9	0.02	µg/L	<0.02	0.25 µg/L	116	69.0	121

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 3883947) - continued								
EP132-LL: Fluorene	86-73-7	0.02	µg/L	<0.02	0.25 µg/L	112	69.0	131
EP132-LL: Phenanthrene	85-01-8	0.02	µg/L	<0.02	0.25 µg/L	110	69.0	137
EP132-LL: Anthracene	120-12-7	0.02	µg/L	<0.02	0.25 µg/L	110	64.0	120
EP132-LL: Fluoranthene	206-44-0	0.02	µg/L	<0.02	0.25 µg/L	105	63.0	129
EP132-LL: Pyrene	129-00-0	0.02	µg/L	<0.02	0.25 µg/L	104	67.0	127
EP132-LL: Benz(a)anthracene	56-55-3	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	132
EP132-LL: Chrysene	218-01-9	0.02	µg/L	<0.02	0.25 µg/L	115	65.0	125
EP132-LL: Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.02	µg/L	<0.02	0.25 µg/L	120	66.0	130
EP132-LL: Benzo(k)fluoranthene	207-08-9	0.02	µg/L	<0.02	0.25 µg/L	99.7	64.0	130
EP132-LL: Benzo(a)pyrene	50-32-8	0.005	µg/L	<0.005	0.25 µg/L	107	61.0	125
EP132-LL: Indeno(1.2.3.cd)pyrene	193-39-5	0.02	µg/L	<0.02	0.25 µg/L	107	67.0	131
EP132-LL: Dibenz(a.h)anthracene	53-70-3	0.02	µg/L	<0.02	0.25 µg/L	106	67.0	135
EP132-LL: Benzo(g.h.i)perylene	191-24-2	0.02	µg/L	<0.02	0.25 µg/L	107	66.0	130
EP132-LL: Total PAH	----	0.005	µg/L	<0.005	----	----	----	----

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**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG020F: Dissolved Metals by ICP-MS (QCLot: 3884565)							
ES2131990-001	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	91.0	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	91.8	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	91.4	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	92.5	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	90.3	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	92.0	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	93.0	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 3884566)							
ES2132020-001	GWSS1	EG035F: Mercury	7439-97-6	0.01 mg/L	94.8	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3886466)							
ES2131927-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	102	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3886466)							
ES2131927-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	100	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080: BTEXN (QCLot: 3886466)							
ES2131927-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	90.3	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	100	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	99.6	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	99.6	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	99.7	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	89.0	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2132020**	Page	: 1 of 4
Client	: **AARGUS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: CYNTHIA	Telephone	: +61-2-8784 8555
Project	: ES8338 DSI	Date Samples Received	: 03-Sep-2021
Site	: GREENACRE	Issue Date	: 08-Sep-2021
Sampler	: SBS	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
PAH Compounds in Water	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	9	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH Compounds in Water	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	9	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Natural (EG020A-F)							
GWSS1	**02-Sep-2021**	**----**	----	----	**06-Sep-2021**	01-Mar-2022	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Natural (EG035F)							
GWSS1	**02-Sep-2021**	**----**	----	----	**06-Sep-2021**	30-Sep-2021	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
GWSS1	**02-Sep-2021**	**06-Sep-2021**	09-Sep-2021	✓	**07-Sep-2021**	16-Oct-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
GWSS1	**02-Sep-2021**	**07-Sep-2021**	16-Sep-2021	✓	**07-Sep-2021**	16-Sep-2021	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071)							
GWSS1	**02-Sep-2021**	**06-Sep-2021**	09-Sep-2021	✓	**07-Sep-2021**	16-Oct-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
GWSS1	**02-Sep-2021**	**07-Sep-2021**	16-Sep-2021	✓	**07-Sep-2021**	16-Sep-2021	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080)							
GWSS1	**02-Sep-2021**	**07-Sep-2021**	16-Sep-2021	✓	**07-Sep-2021**	16-Sep-2021	✓
EP132B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP132-LL)							
GWSS1	**02-Sep-2021**	**06-Sep-2021**	09-Sep-2021	✓	**07-Sep-2021**	16-Oct-2021	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Dissolved Mercury by FIMS	EG035F	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	8	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH Compounds in Water	EP132-LL	0	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	9	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH Compounds in Water	EP132-LL	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH Compounds in Water	EP132-LL	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH Compounds in Water	EP132-LL	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	9	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
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 0.45µm 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 Vapour generation) AAS) Samples are 0.45µm 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).
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)
TRH Volatiles/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)
PAH Compounds in Water	EP132-LL	WATER	In house, Samples are extracted into solvent in original containers. Determination by large volume injection GCMS in selected ion monitoring (SIM) mode.

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.
Sep. Funnel Extraction /Acetylation of Phenolic Compounds	ORG14-AC	WATER	In house: Referenced to USEPA 3510 (Extraction) / In-house (Acetylation): A 1L sample is extracted into dichloromethane and concentrated to 1 mL with echange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2132020**

Client	: **AARGUS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: CYNTHIA	Contact	: Customer Services ES
Address	: PO BOX 398 DRUMMOYNE NSW, AUSTRALIA 2047	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: cynthia@aargus.net	E-mail	: ALSEnviro.Sydney@ALSGlobal.com
Telephone	: +61 1300137038	Telephone	: +61-2-8784 8555
Facsimile	: +61 1300136038	Facsimile	: +61-2-8784 8500
Project	: ES8338 DSI	Page	: 1 of 3
Order number	: ----	Quote number	: EB2017AARGUS0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: GREENACRE		
Sampler	: SBS		

Dates

Date Samples Received	: 03-Sep-2021 08:50	Issue Date	: 03-Sep-2021
Client Requested Due Date	: 08-Sep-2021	Scheduled Reporting Date	: **08-Sep-2021**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 8.3'C - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **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 laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- 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.

Method Sample ID	Sample Container Received	Preferred Sample Container for Analysis
Dissolved Mercury by FIMS : EG035F		
GWSS1	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered
Dissolved Metals by ICP-MS - Suite A : EG020A-F		
GWSS1	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered

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 - GW-2 TRH/BTEX/8 METALS/SUT PAH
ES2132020-001	02-Sep-2021 00:00	GWSS1	✓

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	anika@aargus.net

ANIKA

- A4 - AU Tax Invoice (INV)	Email	anika@aargus.net

CYNTHIA

- *AU Certificate of Analysis - NATA (COA)	Email	cynthia@aargus.net
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	cynthia@aargus.net
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	cynthia@aargus.net
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	cynthia@aargus.net
- A4 - AU Tax Invoice (INV)	Email	cynthia@aargus.net
- Chain of Custody (CoC) (COC)	Email	cynthia@aargus.net
- EDI Format - ESDAT (ESDAT)	Email	cynthia@aargus.net
- EDI Format - XTab (XTAB)	Email	cynthia@aargus.net

Gokul

- *AU Certificate of Analysis - NATA (COA)	Email	gokul@aargus.net
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	gokul@aargus.net
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	gokul@aargus.net
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	gokul@aargus.net
- A4 - AU Tax Invoice (INV)	Email	gokul@aargus.net
- Chain of Custody (CoC) (COC)	Email	gokul@aargus.net
- EDI Format - ESDAT (ESDAT)	Email	gokul@aargus.net
- EDI Format - XTab (XTAB)	Email	gokul@aargus.net

MARK KELLY

- *AU Certificate of Analysis - NATA (COA)	Email	mark.kelly@aargus.net
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	mark.kelly@aargus.net
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	mark.kelly@aargus.net
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	mark.kelly@aargus.net
- A4 - AU Tax Invoice (INV)	Email	mark.kelly@aargus.net
- Chain of Custody (CoC) (COC)	Email	mark.kelly@aargus.net
- EDI Format - ESDAT (ESDAT)	Email	mark.kelly@aargus.net
- EDI Format - XTab (XTAB)	Email	mark.kelly@aargus.net

NINGYE ZHANG

- *AU Certificate of Analysis - NATA (COA)	Email	ningye@aargus.net
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ningye@aargus.net
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ningye@aargus.net
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ningye@aargus.net
- A4 - AU Tax Invoice (INV)	Email	ningye@aargus.net
- Chain of Custody (CoC) (COC)	Email	ningye@aargus.net
- EDI Format - ESDAT (ESDAT)	Email	ningye@aargus.net
- EDI Format - XTab (XTAB)	Email	ningye@aargus.net

AARGUS PTY LTD

6 Carter Street
Lidcombe, NSW 2141

P O Box 398 Tel: 1300 137 038
DRUMMOYNE NSW 1470 Fax: 1300 136 038

Email reports: cynthia@aargus.net; gokul@aargus.net; mark.kelly@aargus.net;ningye@aargus.net
Email invoices: anika@aargus.net; cynthia@aargus.net; gokul@aargus.net; mark.kelly@aargus.net; ningye@aargus.net

Laboratory Test Request / Chain of Custody Record

TO: ALS (Australian Laboratory Services) | Environmental
277 - 289 Woodpark Road
SMITHFIELD, NSW 2164

PH: 02 8784 8555 **FAX:** 02 8784 8500
ATTN: Samples Receipt

Sampling Date:	02.09.2021	**Job No:**	ES8338
Sampled By:	SBS	**Project:**	DSI
Project Manager:	MK	**Location:**	GREENACRE

Results required by: WEDNESDAY, 8TH SEPTEMBER 2021

Sampling details			Sample type											
Location	Depth (m)	Date	Soil	Water (Filled Up)	Air	PLEASE FILTER IN THE LAB Metals (As, Cd, Cr, Cu, Hg, Pb, Ni, Zn)	TPH & BTEX	SUPER ULTRA TRACE PAH					Analysis Suite(s)	KEEP SAMPLE?
GWSS1	-	02.09.2021	WG, WP, Vial			✓	✓	✓					GW-2	YES

Relinquished by			Received by		
Name	Signature	Date	Name	Signature	Date
SAAD	SBS	02.09.2021			3/9/21 0:50

Legend:

WG	Water sample, glass bottle	USG	Undisturbed soil sample (glass ja	DSP	Disturbed soil sample (small plastic bag)
WP	Water sample, plastic bottle	DSG	Disturbed soil sample (glass jar)	✓	Test required
GV	Glass vial	OTH	Other	ACAN	Air sample, canister

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Environmental Division
Sydney
Work Order Reference
ES2132020

Telephone : +61-2-8784 8555

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2131821**	Page	: 1 of 7
Client	: **AARGUS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR MARK KELLY	Contact	: Customer Services ES
Address	: PO BOX 398 DRUMMOYNE NSW, AUSTRALIA 2047	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: 1300137038	Telephone	: +61-2-8784 8555
Project	: ES8338 DSI	Date Samples Received	: 01-Sep-2021 22:15
Order number	: ----	Date Analysis Commenced	: 02-Sep-2021
C-O-C number	: ----	Issue Date	: 08-Sep-2021 16:44
Sampler	: SBS		
Site	: Greenacre		
Quote number	: EN/222		
No. of samples received	: 2		
No. of samples analysed	: 2		

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
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

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 Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- 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.
- 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 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- 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
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- 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.
- 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.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SS1	SS2	----	----	----
			Sampling date / time	31-Aug-2021 00:00	31-Aug-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2131821-001	ES2131821-002	--------	--------	--------
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**12.9**	**6.0**	----	----	----
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	**774**	**776**	----	----	----
Synthetic Mineral Fibre	----	0.1	g/kg	**No**	**No**	----	----	----
Organic Fibre	----	0.1	g/kg	**No**	**No**	----	----	----
APPROVED IDENTIFIER:	----	-	--	**A. SMYLIE**	**A. SMYLIE**	----	----	----
EA200N: Asbestos Quantification (non-NATA)								
ø Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	<0.0004	<0.0004	----	----	----
ø Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	<0.001	<0.001	----	----	----
ø Asbestos Containing Material	1332-21-4	0.1	g	<0.1	<0.1	----	----	----
ø Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	% (w/w)	<0.01	<0.01	----	----	----
ø Weight Used for % Calculation	----	0.0001	kg	**0.774**	**0.776**	----	----	----
ø Fibrous Asbestos >7mm	----	0.0004	g	<0.0004	<0.0004	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	**18**	**60**	----	----	----
Copper	7440-50-8	5	mg/kg	**18**	**51**	----	----	----
Lead	7439-92-1	5	mg/kg	**20**	**11**	----	----	----
Nickel	7440-02-0	2	mg/kg	**22**	**58**	----	----	----
Zinc	7440-66-6	5	mg/kg	**23**	**61**	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	SS1	SS2	----	----	----
				Sampling date / time	31-Aug-2021 00:00	31-Aug-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2131821-001	ES2131821-002	--------	--------	--------
					Result	Result	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued									
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	----	----	----
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	----	----	----
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	----	----	----
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	----	----	----
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	----	----	----
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.05	mg/kg		<0.05	<0.05	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	----	----	----
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	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SS1	SS2	----	----	----
			Sampling date / time	31-Aug-2021 00:00	31-Aug-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2131821-001	ES2131821-002	--------	--------	--------
				Result	Result	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
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	**130**	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	**130**	----	----	----
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	**120**	**140**	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	**120**	**170**	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	**240**	**310**	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	----	----	----
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	SS1	SS2	----	----	----
				Sampling date / time	31-Aug-2021 00:00	31-Aug-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2131821-001	ES2131821-002	--------	--------	--------
					Result	Result	----	----	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		**86.3**	**93.6**	**----**	**----**	**----**
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**83.1**	**70.0**	**----**	**----**	**----**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**80.2**	**62.4**	**----**	**----**	**----**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**79.1**	**78.2**	**----**	**----**	**----**
2-Chlorophenol-D4	93951-73-6	0.5	%		**84.8**	**87.6**	**----**	**----**	**----**
2.4.6-Tribromophenol	118-79-6	0.5	%		**71.0**	**74.1**	**----**	**----**	**----**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**94.1**	**92.2**	**----**	**----**	**----**
Anthracene-d10	1719-06-8	0.5	%		**100**	**98.9**	**----**	**----**	**----**
4-Terphenyl-d14	1718-51-0	0.5	%		**94.5**	**90.7**	**----**	**----**	**----**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**86.7**	**87.9**	**----**	**----**	**----**
Toluene-D8	2037-26-5	0.2	%		**84.5**	**83.5**	**----**	**----**	**----**
4-Bromofluorobenzene	460-00-4	0.2	%		**86.0**	**87.5**	**----**	**----**	**----**

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Sample ID - Sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	SS1 - 31-Aug-2021 00:00	Soil sample.
EA200: Description	SS2 - 31-Aug-2021 00:00	Soil sample.

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
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

Inter-Laboratory Testing

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

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

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

QUALITY CONTROL REPORT

Work Order	: **ES2131821**	Page	: 1 of 9
Client	: **AARGUS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR MARK KELLY	Contact	: Customer Services ES
Address	: PO BOX 398 DRUMMOYNE NSW, AUSTRALIA 2047	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: 1300137038	Telephone	: +61-2-8784 8555
Project	: ES8338 DSI	Date Samples Received	: 01-Sep-2021
Order number	: ----	Date Analysis Commenced	: 02-Sep-2021
C-O-C number	: ----	Issue Date	: 08-Sep-2021
Sampler	: SBS		
Site	: Greenacre		
Quote number	: EN/222		
No. of samples received	: 2		
No. of samples analysed	: 2		

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
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

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.

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3887401)									
ES2131757-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	12	20	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	5	8	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	8	13	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	25	45	13.2	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	163	213	17.2	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	102	192	19.6	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3887403)									
ES2131798-010	Anonymous	EA055: Moisture Content	----	0.1	%	20.9	20.3	2.8	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3887402)									
ES2131757-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.2	0.5	40.5	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3881242)									
ES2131281-002	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3881239)									
ES2131281-002	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3881239) - continued									
ES2131281-002	Anonymous	EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3881241)									
ES2131798-005	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	2.2	2.0	7.2	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	1.7	1.6	8.6	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	1.2	1.2	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	1.2	1.1	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	2.0	1.8	14.3	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	0.8	0.7	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	1.3	1.2	12.2	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	0.8	0.7	17.5	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	0.8	0.7	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	12.0	11.0	8.7	0% - 20%
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	1.8	1.6	8.2	No Limit
ES2131281-002	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	0.8	1.0	19.1	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3881241) - continued									
ES2131281-002	Anonymous	EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	0.8	1.0	20.2	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	0.6	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	1.6	2.6	47.6	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3880915)									
ES2131757-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES2131798-011	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3881240)									
ES2131798-005	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES2131281-002	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3880915)									
ES2131757-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2131798-011	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3881240)									
ES2131798-005	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	100	100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES2131281-002	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEXN (QC Lot: 3880915)									
ES2131757-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080: BTEXN (QC Lot: 3880915) - continued									
ES2131757-001	Anonymous	EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES2131798-011	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control 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: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3887401)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	90.9	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	97.6	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	99.7	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	98.9	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	95.3	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	92.0	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	90.0	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3887402)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	97.7	70.0	125
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3881242)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	92.8	62.0	126
EP068A: Organochlorine Pesticides (OC) (QCLot: 3881239)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	83.3	69.0	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	83.1	65.0	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	82.0	67.0	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	88.7	68.0	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	78.2	65.0	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	80.2	67.0	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	85.9	69.0	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	85.8	62.0	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	86.4	63.0	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	88.4	66.0	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	82.7	64.0	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	84.3	66.0	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	86.7	67.0	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	78.0	67.0	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	86.0	69.0	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	85.5	69.0	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	86.3	56.0	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	86.2	62.0	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	80.0	66.0	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	87.6	64.0	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	76.7	54.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3881241)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3881241) - continued								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	91.0	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	84.4	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	92.3	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	87.9	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	90.6	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	93.8	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	91.4	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	90.0	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	77.8	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	91.4	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	77.6	68.0	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	88.7	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	86.6	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	77.9	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	79.7	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	84.4	63.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3880915)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	86.0	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3881240)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	106	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 Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3880915)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	87.2	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3881240)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	107	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	101	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	96.2	63.0	131
EP080: BTEXN (QCLot: 3880915)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	87.4	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	84.6	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	84.1	65.0	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	82.0	66.0	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	81.3	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	86.6	63.0	119

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3887401)							
ES2131757-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	92.8	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	94.5	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	92.9	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	94.0	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	83.5	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	91.5	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	94.6	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3887402)							
ES2131757-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	101	70.0	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3881242)							
ES2131281-002	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	93.3	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 3881239)							
ES2131281-002	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	83.4	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	103	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	86.4	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	80.9	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	85.2	70.0	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	76.3	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3881241)							
ES2131281-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	90.4	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	96.0	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3880915)							
ES2131757-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	111	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3881240)							
ES2131281-002	Anonymous	EP071: C10 - C14 Fraction	----	480 mg/kg	110	73.0	137
		EP071: C15 - C28 Fraction	----	3100 mg/kg	114	53.0	131
		EP071: C29 - C36 Fraction	----	2060 mg/kg	117	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3880915)							
ES2131757-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	117	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3881240)							
ES2131281-002	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	114	73.0	137
		EP071: >C16 - C34 Fraction	----	4320 mg/kg	116	53.0	131

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3881240) - continued							
ES2131281-002	Anonymous	EP071: >C34 - C40 Fraction	----	890 mg/kg	99.6	52.0	132
EP080: BTEXN (QCLot: 3880915)							
ES2131757-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	80.8	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	86.2	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	82.3	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	90.0	70.0	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	79.8	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	81.8	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2131821**	Page	: 1 of 6
Client	: **AARGUS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR MARK KELLY	Telephone	: +61-2-8784 8555
Project	: ES8338 DSI	Date Samples Received	: 01-Sep-2021
Site	: Greenacre	Issue Date	: 08-Sep-2021
Sampler	: SBS	No. of samples received	: 2
Order number	: ----	No. of samples analysed	: 2

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055)							
SS1, SS2	**31-Aug-2021**	**----**	----	----	**07-Sep-2021**	14-Sep-2021	✓
EA200: AS 4964 - 2004 Identification of Asbestos in Soils							
Snap Lock Bag - Friable Asbestos/PSD Bag (EA200)							
SS1, SS2	**31-Aug-2021**	**----**	----	----	**02-Sep-2021**	27-Feb-2022	✓
EA200N: Asbestos Quantification (non-NATA)							
Snap Lock Bag - Friable Asbestos/PSD Bag (EA200N)							
SS1, SS2	**31-Aug-2021**	**----**	----	----	**02-Sep-2021**	27-Feb-2022	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
SS1, SS2	**31-Aug-2021**	**07-Sep-2021**	27-Feb-2022	✓	**07-Sep-2021**	27-Feb-2022	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
SS1, SS2	**31-Aug-2021**	**07-Sep-2021**	28-Sep-2021	✓	**08-Sep-2021**	28-Sep-2021	✓
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066)							
SS1, SS2	**31-Aug-2021**	**03-Sep-2021**	14-Sep-2021	✓	**07-Sep-2021**	13-Oct-2021	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068)							
SS1, SS2	**31-Aug-2021**	**03-Sep-2021**	14-Sep-2021	✓	**07-Sep-2021**	13-Oct-2021	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
SS1, SS2	**31-Aug-2021**	**03-Sep-2021**	14-Sep-2021	✓	**07-Sep-2021**	13-Oct-2021	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
SS1, SS2	**31-Aug-2021**	**02-Sep-2021**	14-Sep-2021	✓	**07-Sep-2021**	14-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP071)							
SS1, SS2	**31-Aug-2021**	**03-Sep-2021**	14-Sep-2021	✓	**07-Sep-2021**	13-Oct-2021	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP080)								
SS1,	SS2	**31-Aug-2021**	**02-Sep-2021**	14-Sep-2021	✓	**07-Sep-2021**	14-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP071)								
SS1,	SS2	**31-Aug-2021**	**03-Sep-2021**	14-Sep-2021	✓	**07-Sep-2021**	13-Oct-2021	✓
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080)								
SS1,	SS2	**31-Aug-2021**	**02-Sep-2021**	14-Sep-2021	✓	**07-Sep-2021**	14-Sep-2021	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM 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 Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	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 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 Volatiles/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.

Preparation Methods	Method	Matrix	Method Descriptions

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).
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 : **ES2131821**

Client	: **AARGUS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR MARK KELLY	Contact	: Customer Services ES
Address	: PO BOX 398 DRUMMOYNE NSW, AUSTRALIA 2047	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: mark.kelly@aargus.net	E-mail	: ALSEnviro.Sydney@ALSGlobal.com
Telephone	: 1300137038	Telephone	: +61-2-8784 8555
Facsimile	: 1300136038	Facsimile	: +61-2-8784 8500
Project	: ES8338 DSI	Page	: 1 of 3
Order number	: ----	Quote number	: EB2017AARGUS0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Greenacre		
Sampler	: SBS		

Dates

Date Samples Received	: 01-Sep-2021 22:15	Issue Date	: 02-Sep-2021
Client Requested Due Date	: 08-Sep-2021	Scheduled Reporting Date	: **08-Sep-2021**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 12.6'C - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 2 / 2

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **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 laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EA200N Asbestos in Soils - (<1kg samples ONLY)	SOIL - S-08 TRH/BTEXN/PAH/OC/PCB/8 Metals
ES2131821-001	31-Aug-2021 00:00	SS1	✓	✓	✓
ES2131821-002	31-Aug-2021 00:00	SS2	✓	✓	✓

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	anika@aargus.net

CYNTHIA

- *AU Certificate of Analysis - NATA (COA)	Email	cynthia@aargus.net
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	cynthia@aargus.net
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	cynthia@aargus.net
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	cynthia@aargus.net
- A4 - AU Tax Invoice (INV)	Email	cynthia@aargus.net
- Chain of Custody (CoC) (COC)	Email	cynthia@aargus.net
- EDI Format - ESDAT (ESDAT)	Email	cynthia@aargus.net
- EDI Format - XTab (XTAB)	Email	cynthia@aargus.net

Gokul

- *AU Certificate of Analysis - NATA (COA)	Email	gokul@aargus.net
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	gokul@aargus.net
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	gokul@aargus.net
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	gokul@aargus.net
- A4 - AU Tax Invoice (INV)	Email	gokul@aargus.net
- Chain of Custody (CoC) (COC)	Email	gokul@aargus.net
- EDI Format - ESDAT (ESDAT)	Email	gokul@aargus.net
- EDI Format - XTab (XTAB)	Email	gokul@aargus.net

MARK KELLY

- *AU Certificate of Analysis - NATA (COA)	Email	mark.kelly@aargus.net
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	mark.kelly@aargus.net
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	mark.kelly@aargus.net
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	mark.kelly@aargus.net
- A4 - AU Tax Invoice (INV)	Email	mark.kelly@aargus.net
- Chain of Custody (CoC) (COC)	Email	mark.kelly@aargus.net
- EDI Format - ESDAT (ESDAT)	Email	mark.kelly@aargus.net
- EDI Format - XTab (XTAB)	Email	mark.kelly@aargus.net

NINGYE ZHANG

- *AU Certificate of Analysis - NATA (COA)	Email	ningye@aargus.net
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ningye@aargus.net
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ningye@aargus.net
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ningye@aargus.net
- A4 - AU Tax Invoice (INV)	Email	ningye@aargus.net
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AARGUS PTY LTD

6 Carter Street
Lidcombe, NSW 2141

P O Box 398 Tel: 1300 137 038
DRUMMOYNE NSW 1470 Fax: 1300 136 038

Email reports: cynthia@aargus.net; gokul@aargus.net; mark.kelly@aargus.net;ningye@aargus.net
Email invoices: anika@aargus.net; cynthia@aargus.net; gokul@aargus.net; mark.kelly@aargus.net; ningye@aargus.net

Laboratory Test Request / Chain of Custody Record

TO: ALS (Australian Laboratory Services) | Environmental
277 - 289 Woodpark Road
SMITHFIELD, NSW 2164

PH: 02 8784 8555 **FAX:** 02 8784 8500
ATTN: Samples Receipt

Sampling Date: 31.08.2021 **Job No:** ES8338
Sampled By: SBS **Project:** DSI
Project Manager: MK **Location:** GREENACRE

Results required by: WEDNESDAY, 8TH SEPTEMBER 2021

Sampling details			Sample type													
Location	Depth (m)	Date	Soil	Water (Filled Up)	Air	Metals (As, Cd, Cr, Cu, Hg, Pb, Ni, Zn)	TPH & BTEX	PAH	OC	PCB				Asbestos %w/w	Analysis Suite(s)	KEEP SAMPLE?
SS1	-	31.08.2021	DSG, DSP			✓	✓	✓	✓	✓				✓	S8	YES
SS2	-	31.08.2021	DSG, DSP			✓	✓	✓	✓	✓				✓	S8	YES

Relinquished by			Received by		
Name	Signature	Date	Name	Signature	Date
SAAD	SBS	01.09.2021	[illegible]	[illegible]	01/9/21 2215

Legend:

WG	Water sample, glass bottle	USG	Undisturbed soil sample (glass ja	DSP	Disturbed soil sample (small plastic bag)
WP	Water sample, plastic bottle	DSG	Disturbed soil sample (glass jar)	✓	Test required
GV	Glass vial	OTH	Other	ACAN	Air sample, canister

@ mole H^+/tonne

Environmental Division
Sydney
Work Order Reference
ES2131821

Telephone : + 61-2-8784 8555

AUSTRALIAN SAFER ENVIRONMENT & TECHNOLOGY PTY LTD

ABN 36 088 095 112

Our ref : ASET95822 / 99002 / 1 – 13
Your ref : ES8338 – DSI - Greenacre
NATA Accreditation No: 14484

3 September 2021

Aargus Pty Ltd
6 Carter Street
Lidcombe NSW 2141

Attn: Mr Mark Kelly

Accredited for compliance with ISO/IEC 17025 - Testing.

Dear Mark

Asbestos Identification
This report presents the results of thirteen samples out of twenty five samples, forwarded by Aargus Pty Ltd on 1 September 2021, for analysis for asbestos.

1.Introduction: Thirteen samples out of twenty five samples forwarded were examined and analysed for the presence of asbestos on 3 September 2021.

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

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

3. Results :

Sample No. 1. ASET95822 / 99002 / 1. ES8338 - BH1-0.3-0.4.
Approx dimensions 10.0 cm x 10.0 cm x 5.0 cm
Approximate total dry weight of soil = 577.0g.
The sample consisted of a mixture of clayish sandy soil, stones, organic fibres, timber char, sandstones and plant matter.
No asbestos detected.

Sample No. 2. ASET95822 / 99002 / 2. ES8338 - BH2-0.3-0.4.
Approx dimensions 10.0 cm x 10.0 cm x 6.2 cm
Approximate total dry weight of soil = 761.0g.
The sample consisted of a mixture of clayish sandy soil, sandstones, organic fibres, stones and plant matter.
No asbestos detected.

Sample No. 3. ASET95822 / 99002 / 3. ES8338 - BH3-0.2-0.3.
Approx dimensions 10.0 cm x 10.0 cm x 5.0 cm
Approximate total dry weight of soil = 492.0g.
The sample consisted of a mixture of clayish sandy soil, wood chips, sandstones, organic fibres, stones and plant matter.
No asbestos detected.

Sample No. 4. ASET95822 / 99002 / 4. ES8338 - BH4-0.2-0.4.
Approx dimensions 10.0 cm x 10.0 cm x 5.4 cm
Approximate total dry weight of soil = 664.0g.
The sample consisted of a mixture of sandy soil, sandstones, timber char, organic fibres, stones and plant matter.
No asbestos detected.

Sample No. 5. ASET95822 / 99002 / 5. ES8338 - BH5-0.2-0.5.
Approx dimensions 10.0 cm x 10.0 cm x 5.9 cm
Approximate total dry weight of soil = 713.0g.
The sample consisted of a mixture of clayish sandy soil, stones, wood chips, sandstones, organic fibres and plant matter.
No asbestos detected.

Sample No. 6. ASET95822 / 99002 / 6. ES8338 - BH6-0.2-0.6.
Approx dimensions 10.0 cm x 10.0 cm x 6.1 cm
Approximate total dry weight of soil = 756.0g.
The sample consisted of a mixture of sandy soil, sandstones, organic fibres, stones and plant matter.
No asbestos detected.

Sample No. 7. ASET95822 / 99002 / 7. ES8338 - BH7-0.3-0.4.
Approx dimensions 10.0 cm x 10.0 cm x 7.6 cm
Approximate total dry weight of soil = 926.0g.
The sample consisted of a mixture of clayish sandy soil, stones, brick like material, sandstones, organic fibres and plant matter.
No asbestos detected.

Ω Sample No. 8. ASET95822 / 99002 / 8. ES8338 - BH8-0-0.1.
Approx dimensions 10.0 cm x 10.0 cm x 4.5 cm
Approximate total dry weight of soil = 351.0g.
The sample consisted of a mixture of sandy soil, stones, paint flakes, wood chips, sandstones, glass pieces, organic fibres and plant matter.
No asbestos detected.

Sample No. 9. ASET95822 / 99002 / 9. ES8338 - BH9-0.2-0.3.
Approx dimensions 10.0 cm x 10.0 cm x 7.0 cm
Approximate total dry weight of soil = 840.0g.
The sample consisted of a mixture of clayish sandy soil, stones, organic fibres, sandstones and plant matter.
No asbestos detected.

Sample No. 10. ASET95822 / 99002 / 10. ES8338 - BH10-0.3-0.4.
Approx dimensions 10.0 cm x 10.0 cm x 8.3 cm
Approximate total dry weight of soil = 1102.0g.
The sample consisted of a mixture of clayish sandy soil, stones, sandstones, organic fibres and plant matter.
No asbestos detected.

Sample No. 11. ASET95822 / 99002 / 11. ES8338 - BH11-0.2-0.3.
Approx dimensions 10.0 cm x 10.0 cm x 5.1 cm
Approximate total dry weight of soil = 561.0g.
The sample consisted of a mixture of clayish sandy soil, stones, sandstones, organic fibres and plant matter.
No asbestos detected.

Sample No. 12. ASET95822 / 99002 / 12. ES8338 - BH12-0.3-0.4.
Approx dimensions 10.0 cm x 10.0 cm x 7.7 cm
Approximate total dry weight of soil = 943.0g.
The sample consisted of a mixture of clayish sandy soil, stones, organic fibres, sandstones and plant matter.
No asbestos detected.

Sample No. 13. ASET95822 / 99002 / 13. ES8338 - BH13-0.2-0.3.
Approx dimensions 10.0 cm x 10.0 cm x 5.1 cm
Approximate total dry weight of soil = 599.0g.
The sample consisted of a mixture of sandy soil, stones, sandstones, wood chips, organic fibres and plant matter.
No asbestos detected.

Reported by,

Mahen De Silva. BSc, MSc, Grad Dip (Occ Hyg)
Occupational Hygienist / Approved Identifier.
Approved Signatory

WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

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

Disclaimers;

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

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

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

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

^ denotes loose fibres of relevant asbestos types detected in soil/dust.
*** denotes asbestos detected in ACM in bonded form.**

 # denotes friable asbestos as soft fibro plaster and/ or highly weathered ACM that will easily crumble.

λ denotes samples that have been analysed only in accordance to AS 4964 – 2004.

Ω Sample volume criteria of 500mL have not been satisfied.

The results contained in this report relate only to the sample/s submitted for testing. Australian Safer Environment & Technology accepts no responsibility for whether or not the submitted sample/s is/are representative. Results indicating "No asbestos detected" indicates a reporting limit specified in AS4964 -2004 which is 0.1g/ Kg (0.01%). Any amounts detected at assumed lower level than that would be reported, however those assumed lower levels may be treated as "No asbestos detected" as specified and recommended by A4964-2004. Trace / respirable level asbestos will be reported only when detected and trace analysis have been performed on each sample as required by AS4964-2004. When loose asbestos fibres/ fibre bundles are detected and reported that means they are larger handpicked fibres/ fibre bundles, and they do not represent respirable fibres. Dust/soil samples are always subjected to trace analysis except where the amounts involved are extremely minute and trace analysis is not possible to be carried out. When trace analysis is not performed on dust samples it will be indicated in the report that trace analysis has not been carried out due to the volume of the sample being extremely minute.

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

All samples indicating "No asbestos detected" are assumed to be less than 0.001% for friable AF and FA portions detected and 0.01 % for ACM detected unless the approximate weight is given.

AUSTRALIAN SAFER ENVIRONMENT & TECHNOLOGY PTY LTD

ABN 36 088 095 112

Our ref : ASET95822 / 99002 / 14 - 25
Your ref : ES8338 – DSI - Greenacre
NATA Accreditation No: 14484

3 September 2021

Aargus Pty Ltd
6 Carter Street
Lidcombe NSW 2141

Attn: Mr Mark Kelly

Accredited for compliance with ISO/IEC 17025 - Testing.

Dear Mark

Asbestos Identification
This report presents the results of twelve samples out of twenty five samples, forwarded by Aargus Pty Ltd on 1 September 2021, for analysis for asbestos.

1.Introduction: Twelve samples out of twenty five samples forwarded were examined and analysed for the presence of asbestos on 3 September 2021.

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

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

3. Results :

Sample No. 14. ASET95822 / 99002 / 14. ES8338 - BH14-0.2-0.3.
Approx dimensions 10.0 cm x 10.0 cm x 6.4 cm
Approximate total dry weight of soil = 643.0g.
The sample consisted of a mixture of clayish sandy soil, stones, fragments of wood chips and plant matter.
No asbestos detected.

Sample No. 15. ASET95822 / 99002 / 15. ES8338 - BH15-0.1-0.2.
Approx dimensions 10.0 cm x 10.0 cm x 8.5 cm
Approximate total dry weight of soil = 853.0g.
The sample consisted of a mixture of clayish sandy soil, organic fibres, stones, fragments of plastic, wood chips and plant matter.
No asbestos detected.

Sample No. 16. ASET95822 / 99002 / 16. ES8338 - BH16-0.2-0.3.
Approx dimensions 10.0 cm x 10.0 cm x 7.0 cm
Approximate total dry weight of soil = 704.0g.
The sample consisted of a mixture of clayish sandy soil, stones, fragments of cement, shale and plant matter.
No asbestos detected.

Sample No. 17. ASET95822 / 99002 / 17. ES8338 - BH17-0.1-0.2.
Approx dimensions 10.0 cm x 10.0 cm x 7.0 cm
Approximate total dry weight of soil = 698.0g.
The sample consisted of a mixture of clayish sandy soil, stones, fragments of wood chips and plant matter.
No asbestos detected.

Sample No. 18. ASET95822 / 99002 / 18. ES8338 - BH18-0.1-0.2.
Approx dimensions 10.0 cm x 10.0 cm x 6.3 cm
Approximate total dry weight of soil = 628.0g.
The sample consisted of a mixture of clayish sandy soil, stones, fragments of brick, cement, slag, wood chips and plant matter.
No asbestos detected.

Sample No. 19. ASET95822 / 99002 / 19. ES8338 - BH19-0.1-0.2.
Approx dimensions 10.0 cm x 10.0 cm x 5.9 cm
Approximate total dry weight of soil = 585.0g.
The sample consisted of a mixture of clayish sandy soil, stones, fragments of wood chips and plant matter.
No asbestos detected.

Sample No. 20. ASET95822 / 99002 / 20. ES8338 - BH20-0.2-0.3.
Approx dimensions 10.0 cm x 10.0 cm x 8.2 cm
Approximate total dry weight of soil = 817.0g.
The sample consisted of a mixture of clayish sandy soil, stones, fragments of cement, shale and plant matter.
No asbestos detected.

Sample No. 21. ASET95822 / 99002 / 21. ES8338 - BH21-0-0.1.
Approx dimensions 10.0 cm x 10.0 cm x 5.7 cm
Approximate total dry weight of soil = 566.0g.
The sample consisted of a mixture of clayish sandy soil, organic fibres, stones, fragments of glass, plastic, wood chips and plant matter.
No asbestos detected.

Sample No. 22. ASET95822 / 99002 / 22. ES8338 - BH22-0.1-0.2.
Approx dimensions 10.0 cm x 10.0 cm x 6.0 cm
Approximate total dry weight of soil = 598.0g.
The sample consisted of a mixture of clayish sandy soil, stones, fragments of wood chips and plant matter.
No asbestos detected.

Sample No. 23. ASET95822 / 99002 / 23. ES8338 - BH23-0.1-0.2.
Approx dimensions 10.0 cm x 10.0 cm x 7.3 cm
Approximate total dry weight of soil = 733.0g.
The sample consisted of a mixture of clayish sandy soil, organic fibres, stones, fragments of cement, paint flakes, plastic, slag, wood chips and plant matter.
No asbestos detected.

Sample No. 24. ASET95822 / 99002 / 24. ES8338 - D1.
Approx dimensions 10.0 cm x 10.0 cm x 8.5 cm
Approximate total dry weight of soil = 850.0g.
The sample consisted of a mixture of clayish sandy soil, stones and plant matter.
No asbestos detected.

Sample No. 25. ASET95822 / 99002 / 25. ES8338 - D2.
Approx dimensions 10.0 cm x 10.0 cm x 7.4 cm
Approximate total dry weight of soil = 743.0g.
The sample consisted of a mixture of clayish sandy soil, stones, fragments of cement, glass, wood chips and plant matter.
No asbestos detected.

Reported by,

Mahen De Silva. BSc, MSc, Grad Dip (Occ Hyg)
Occupational Hygienist / Approved Identifier.
Approved Signatory

WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

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

Disclaimers;

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

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

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

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

^ denotes loose fibres of relevant asbestos types detected in soil/dust.
*** denotes asbestos detected in ACM in bonded form.**
 # denotes friable asbestos as soft fibro plaster and/ or highly weathered ACM that will easily crumble.

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

reported only when detected and trace analysis have been performed on each sample as required by AS4964-2004. When loose asbestos fibres/ fibre bundles are detected and reported that means they are larger handpicked fibres/ fibre bundles, and they do not represent respirable fibres. Dust/soil samples are always subjected to trace analysis except where the amounts involved are extremely minute and trace analysis is not possible to be carried out. When trace analysis is not performed on dust samples it will be indicated in the report that trace analysis has not been carried out due to the volume of the sample being extremely minute.

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

All samples indicating "No asbestos detected" are assumed to be less than 0.001% for friable AF and FA portions detected and 0.01 % for ACM detected unless the approximate weight is given.

ASET95822/99002/1-25

AARGUS PTY LTD

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P O Box 398 Tel: 1300 137 038
DRUMMOYNE NSW 1470 Fax: 1300 136 038

Email to: cynthia@aargus.net; gokul@aargus.net; mark.kelly@aargus.net; sara@aargus.net

Laboratory Test Request / Chain of Custody Record

TO:	**ASET - Australian Safer Environment & Technology Pty Ltd, Sydney** **Suite 710 / 90 George Street** **PO Box 1644** **HORNSBY, NSW 2077** **HORNSBY WESTFIELD NSW 1635**	**Sampling Date:** 31.08.2021	**Job No:** ES8338
		Sampled By: SBS	**Project:** DSI
PH:	**02 9987 2183** **FAX:** **02 9987 2151**	**Project Manager:** MK	**Location:** GREENACRE
ATTN:	**Samples Receipt** **EMAIL** aset@bigpond.net.au		

Results required by: WEDNESDAY, 8TH SEPTEMBER 2021

Sampling details			Sample type											
Location	Depth (m)	Date	Soil Samples	Asbestos presence/absence	Asbestos %w/w									KEEP SAMPLE?
BH1	0.3-0.4	31.08.2021	DSP		✓									YES
BH2	0.3-0.4	31.08.2021	DSP		✓									YES
BH3	0.2-0.3	31.08.2021	DSP		✓									YES
BH4	0.2-0.4	31.08.2021	DSP		✓									YES
BH5	0.2-0.5	31.08.2021	DSP		✓									YES
BH6	0.2-0.6	31.08.2021	DSP		✓									YES
BH7	0.3-0.4	31.08.2021	DSP		✓									YES
BH8	0-0.1	31.08.2021	DSP		✓									YES
BH9	0.2-0.3	31.08.2021	DSP		✓									YES
BH10	0.3-0.4	31.08.2021	DSP		✓									YES
BH11	0.2-0.3	31.08.2021	DSP		✓									YES
BH12	0.3-0.4	31.08.2021	DSP		✓									YES
BH13	0.2-0.3	31.08.2021	DSP		✓									YES
BH14	0.2-0.3	31.08.2021	DSP		✓									YES
BH15	0.1-0.2	31.08.2021	DSP		✓									YES
BH16	0.2-0.3	31.08.2021	DSP		✓									YES
BH17	0.1-0.2	31.08.2021	DSP		✓									YES
BH18	0.1-0.2	31.08.2021	DSP		✓									YES
BH19	0.1-0.2	31.08.2021	DSP		✓									YES
BH20	0.2-0.3	31.08.2021	DSP		✓									YES
BH21	0-0.1	31.08.2021	DSP		✓									YES
BH22	0.1-0.2	31.08.2021	DSP		✓									YES
BH23	0.1-0.2	31.08.2021	DSP		✓									YES
D1	-	31.08.2021	DSP		✓									YES
D2	-	31.08.2021	DSP		✓									YES

RECEIVED
01 SEP 2021
BY:

Relinquished by			Received by		
Name	Signature	Date	Name	Signature	Date
Saad	SBS	01.09.2021			1/9/21 5pm

Legend:

WG	Water sample, glass bottle	USG	Undisturbed soil sample (glass jar)	DSP	Disturbed soil sample (small plastic bag)
WP	Water sample, plastic bottle	DSG	Disturbed soil sample (glass jar)	✓	Test required
GV	Glass vial	OTH	Other	ACAN	Air sample, canister

@ mole H^+/tonne

Aargus Pty Ltd
6 Carter Street
Lidcombe
NSW 2141

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **- ALL INVOICES/SRA - Mark Kelly**

Report **821614-W**
Project name DSI GREENACRE
Project ID ES8338
Received Date Sep 02, 2021

Client Sample ID			**GW1**	**GW2**	**GW5**	**GWD1**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**S21-Se05246**	**S21-Se05247**	**S21-Se05248**	**S21-Se05249**
Date Sampled			**Sep 02, 2021**	**Sep 02, 2021**	**Sep 02, 2021**	**Sep 02, 2021**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	89	91	94	92
Polycyclic Aromatic Hydrocarbons (Trace level)						
Acenaphthene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Acenaphthylene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Anthracene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Benz(a)anthracene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Benzo(a)pyrene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Benzo(b&j)fluoranthene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Benzo(g.h.i)perylene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Benzo(k)fluoranthene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Chrysene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Dibenz(a.h)anthracene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Fluoranthene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Fluorene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Indeno(1.2.3-cd)pyrene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001

Client Sample ID			GW1	GW2	GW5	GWD1
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S21-Se05246	S21-Se05247	S21-Se05248	S21-Se05249
Date Sampled			Sep 02, 2021	Sep 02, 2021	Sep 02, 2021	Sep 02, 2021
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons (Trace level)						
Naphthalene	0.00001	mg/L	< 0.00001	0.00005	< 0.00001	< 0.00001
Phenanthrene	0.00001	mg/L	< 0.00001	0.00014	< 0.00001	< 0.00001
Pyrene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Total PAH*	0.00001	mg/L	< 0.00001	0.00019	< 0.00001	< 0.00001
2-Fluorobiphenyl (surr.)	1	%	94	77	58	65
p-Terphenyl-d14 (surr.)	1	%	76	126	80	133
Heavy Metals						
Arsenic (filtered)	0.001	mg/L	0.001	0.11	0.005	0.002
Cadmium (filtered)	0.0002	mg/L	0.0003	< 0.0002	0.0005	0.0003
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	0.002	< 0.001	0.001	0.002
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	0.006	0.025	0.011	0.006
Zinc (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005

Client Sample ID			TRIP SPIKE	TRIP BLANK
Sample Matrix			Water	Water
Eurofins Sample No.			S21-Se05250	S21-Se05251
Date Sampled			Sep 02, 2021	Sep 02, 2021
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons				
TRH C6-C9	0.02	mg/L	-	< 0.02
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
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	%	-	91
TRH C6-C10	1	%	88	-
Total Recoverable Hydrocarbons				
Naphthalene	1	%	120	-
TRH C6-C9	1	%	91	-
BTEX				
Benzene	1	%	120	-
Ethylbenzene	1	%	130	-
m&p-Xylenes	1	%	130	-
o-Xylene	1	%	120	-
Toluene	1	%	120	-
Xylenes - Total	1	%	120	-
4-Bromofluorobenzene (surr.)	1	%	88	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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	Melbourne	Sep 06, 2021	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Sep 02, 2021	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Sep 06, 2021	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Sep 02, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons (Trace level)	Melbourne	Sep 06, 2021	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water (trace)			
Metals M8 filtered	Sydney	Sep 02, 2021	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Total Recoverable Hydrocarbons	Sydney	Sep 02, 2021	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			

eurofins | Environment Testing

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

Company Name:	Aargus Pty Ltd	**Order No.:**	**Received:** Sep 2, 2021 8:30 PM
Address:	6 Carter Street Lidcombe NSW 2141	**Report #:** 821614 **Phone:** 02 9568 6159 **Fax:** 02 9566 6179	**Due:** Sep 7, 2021 **Priority:** 3 Day **Contact Name:** - ALL INVOICES/SRA - Mark Kelly
Project Name:	DSI GREENACRE		
Project ID:	ES8338		**Eurofins Analytical Services Manager : Asim Khan**

Sample Detail						BTEXN and Volatile TRH	BTEXN and Volatile TRH	Eurofins Suite B7 (filtered metals/PAH trace level)
Melbourne Laboratory - NATA Site # 1254								X
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
Mayfield Laboratory - NATA Site # 25079								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	GW1	Sep 02, 2021		Water	S21-Se05246			X
2	GW2	Sep 02, 2021		Water	S21-Se05247			X
3	GW5	Sep 02, 2021		Water	S21-Se05248			X
4	GWD1	Sep 02, 2021		Water	S21-Se05249			X
5	TRIP SPIKE	Sep 02, 2021		Water	S21-Se05250		X	
6	TRIP BLANK	Sep 02, 2021		Water	S21-Se05251	X		
Test Counts						1	1	4

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							
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	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
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	
TRH >C34-C40	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							
Polycyclic Aromatic Hydrocarbons (Trace level)							
Acenaphthene	mg/L	< 0.00001			0.00001	Pass	
Acenaphthylene	mg/L	< 0.00001			0.00001	Pass	
Anthracene	mg/L	< 0.00001			0.00001	Pass	
Benz(a)anthracene	mg/L	< 0.00001			0.00001	Pass	
Benzo(a)pyrene	mg/L	< 0.00001			0.00001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.00001			0.00001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Chrysene	mg/L	< 0.00001			0.00001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.00001			0.00001	Pass	
Fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Fluorene	mg/L	< 0.00001			0.00001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.00001			0.00001	Pass	
Naphthalene	mg/L	< 0.00001			0.00001	Pass	
Phenanthrene	mg/L	< 0.00001			0.00001	Pass	
Pyrene	mg/L	< 0.00001			0.00001	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	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	102			70-130	Pass	
TRH C10-C14	%	119			70-130	Pass	
Naphthalene	%	106			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C6-C10	%	101			70-130	Pass	
TRH >C10-C16	%	118			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	92			70-130	Pass	
Toluene	%	104			70-130	Pass	
Ethylbenzene	%	108			70-130	Pass	
m&p-Xylenes	%	112			70-130	Pass	
o-Xylene	%	110			70-130	Pass	
Xylenes - Total*	%	111			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons (Trace level)							
Acenaphthene	%	106			70-130	Pass	
Acenaphthylene	%	94			70-130	Pass	
Anthracene	%	92			70-130	Pass	
Benz(a)anthracene	%	76			70-130	Pass	
Benzo(a)pyrene	%	88			70-130	Pass	
Benzo(b&j)fluoranthene	%	127			70-130	Pass	
Benzo(g.h.i)perylene	%	96			70-130	Pass	
Benzo(k)fluoranthene	%	117			70-130	Pass	
Chrysene	%	88			70-130	Pass	
Dibenz(a.h)anthracene	%	88			70-130	Pass	
Fluoranthene	%	123			70-130	Pass	
Fluorene	%	85			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	89			70-130	Pass	
Naphthalene	%	100			70-130	Pass	
Phenanthrene	%	94			70-130	Pass	
Pyrene	%	129			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic (filtered)	%	99			80-120	Pass	
Cadmium (filtered)	%	97			80-120	Pass	
Chromium (filtered)	%	99			80-120	Pass	
Copper (filtered)	%	96			80-120	Pass	
Lead (filtered)	%	103			80-120	Pass	
Mercury (filtered)	%	87			80-120	Pass	
Nickel (filtered)	%	97			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				Result 1					
TRH C10-C14	P21-Se00977	NCP	%	121			70-130	Pass	
TRH >C10-C16	P21-Se00977	NCP	%	124			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	S21-Au54426	NCP	%	98			75-125	Pass	
Cadmium (filtered)	S21-Au54426	NCP	%	94			75-125	Pass	
Chromium (filtered)	S21-Au54426	NCP	%	86			75-125	Pass	
Copper (filtered)	S21-Se08982	NCP	%	80			75-125	Pass	
Lead (filtered)	S21-Au54426	NCP	%	91			75-125	Pass	
Mercury (filtered)	S21-Se08982	NCP	%	85			75-125	Pass	
Nickel (filtered)	S21-Se08982	NCP	%	81			75-125	Pass	
Zinc (filtered)	S21-Se08982	NCP	%	81			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	S21-Se08976	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	M21-Se06457	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M21-Se06457	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M21-Se06457	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Naphthalene	S21-Se08976	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	S21-Se08976	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH >C10-C16	M21-Se06457	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M21-Se06457	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M21-Se06457	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S21-Se08976	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S21-Se08976	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S21-Se08976	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S21-Se08976	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S21-Se08976	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	S21-Se08976	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	S21-Au58557	NCP	mg/L	< 0.001	0.001	9.0	30%	Pass	
Cadmium (filtered)	S21-Au58557	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	S21-Au58557	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	S21-Au58557	NCP	mg/L	0.002	0.001	17	30%	Pass	
Lead (filtered)	S21-Au58557	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	S21-Au58557	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	S21-Au58557	NCP	mg/L	0.006	0.006	7.0	30%	Pass	
Zinc (filtered)	S21-Au58557	NCP	mg/L	0.018	0.016	10	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.

Authorised by:

Asim Khan	Analytical Services Manager
John Nguyen	Senior Analyst-Metal (NSW)
Joseph Edouard	Senior Analyst-Organic (VIC)
Roopesh Rangarajan	Senior Analyst-Volatile (NSW)
Vivian Wang	Senior Analyst-Volatile (VIC)

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.

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

Sample Receipt Advice

Company name:	Aargus Pty Ltd
Contact name:	- ALL INVOICES/SRA - Mark Kelly
Project name:	DSI GREENACRE
Project ID:	ES8338
Turnaround time:	3 Day
Date/Time received	Sep 2, 2021 8:30 PM
Eurofins reference	821614

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	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

No unpreserved bottle received, metals analysis filtered from the total metals bottle as instructed.
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:

Asim Khan on phone : or by email: AsimKhan@eurofins.com

Results will be delivered electronically via email to - ALL INVOICES/SRA - Mark Kelly - mark.kelly@aargus.net.

Global Leader - Results you can trust

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

Company Name: Aargus Pty Ltd
Address: 6 Carter Street
Lidcombe
NSW 2141

Project Name: DSI GREENACRE
Project ID: ES8338

Order No.:
Report #: 821614
Phone: 02 9568 6159
Fax: 02 9566 6179

Received: Sep 2, 2021 8:30 PM
Due: Sep 7, 2021
Priority: 3 Day
Contact Name: - ALL INVOICES/SRA - Mark Kelly

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						BTEXN and Volatile TRH	BTEXN and Volatile TRH	Eurofins Suite B7 (filtered metals/PAH trace level)
Melbourne Laboratory - NATA Site # 1254								X
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
Mayfield Laboratory - NATA Site # 25079								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	GW1	Sep 02, 2021		Water	S21-Se05246			X
2	GW2	Sep 02, 2021		Water	S21-Se05247			X
3	GW5	Sep 02, 2021		Water	S21-Se05248			X
4	GWD1	Sep 02, 2021		Water	S21-Se05249			X
5	TRIP SPIKE	Sep 02, 2021		Water	S21-Se05250		X	
6	TRIP BLANK	Sep 02, 2021		Water	S21-Se05251	X		
Test Counts						1	1	4

AARGUS PTY LTD

Laboratory Test Request / Chain of Custody Record

6 Carter Street
Lidcombe, NSW 2141

P O Box 398 Tel: 1300 137 038
DRUMMOYNE NSW 1470 Fax: 1300 136 038

Email reports: cynthia@aargus.net; gokul@aargus.net; mark.kelly@aargus.net;sara@aargus.net
Email invoices: anika@aargus.net; cynthia@aargus.net; gokul@aargus.net; mark.kelly@aargus.net; sara@aargus.net

TO: MGT EUROFINS
UNIT F3, BUILDING F
16 MARS ROAD
LANE COVE WEST NSW 2066

PH: 028215 6222 FAX: 02 9420 2977
ATTN:

Sampling Date:	02.09.2021	**Job No:**	ES8338
Sampled By:	SBS	**Project:**	DSI
Project Manager:	MK	**Location:**	GREENACRE

Results required by: WEDNESDAY, 8TH SEPTEMBER 2021

Sampling details			Sample type													
Location	Depth (m)	Date	Soil	Water (Filled Up)	Air	PLEASE FILTER IN THE LAB **Metals (As, Cd, Cr, Cu, Hg, Pb, Ni, Zn)**	**TPH / BTEXN**	**TRACE PAH**							**Analysis Suite(s)**	**KEEP SAMPLE?**
GW1		02.09.2021	WG, WP, Vial			✓	✓	✓							B6	YES
GW2		02.09.2021	WG, WP, Vial			✓	✓	✓							B6	YES
GW5		02.09.2021	WG, WP, Vial			✓	✓	✓							B6	YES
GWD1		02.09.2021	WG, WP, Vial			✓	✓	✓							B6	YES
TripSpike		02.09.2021		Vial												YES
TripBlank		02.09.2021		Vial		Please test for TRH F1 and BTEX										YES

Relinquished by			Received by		
Name	Signature	Date	Name	Signature	Date
Saad	SBS	02.09.2021			2/9

Legend:

WG	Water sample, glass bottle	USG	Undisturbed soil sample (glass j	DSP	Disturbed soil sample (small plastic bag)
WP	Water sample, plastic bottle	DSG	Disturbed soil sample (glass jar)	✓	Test required
GV	Glass vial	OTH	Other	ACAN	Air sample, canister

@ mole H^+/tonne

821614

Aargus Pty Ltd
6 Carter Street
Lidcombe
NSW 2141

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **- ALL INVOICES/SRA - Mark Kelly**

Report **821278-W**
Project name DSI GREENACRE
Project ID ES8338
Received Date Sep 01, 2021

Client Sample ID			**RINSATE**
Sample Matrix			**Water**
Eurofins Sample No.			**S21-Se02181**
Date Sampled			**Aug 31, 2021**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
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	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1
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	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1
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	%	76
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
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001

Client Sample ID			RINSATE
Sample Matrix			**Water**
Eurofins Sample No.			**S21-Se02181**
Date Sampled			**Aug 31, 2021**
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
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	%	88
p-Terphenyl-d14 (surr.)	1	%	60
Heavy Metals			
Arsenic	0.001	mg/L	< 0.001
Cadmium	0.0002	mg/L	< 0.0002
Chromium	0.001	mg/L	< 0.001
Copper	0.001	mg/L	< 0.001
Lead	0.001	mg/L	< 0.001
Mercury	0.0001	mg/L	< 0.0001
Nickel	0.001	mg/L	< 0.001
Zinc	0.005	mg/L	< 0.005

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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	Sep 03, 2021	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Sep 01, 2021	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Sep 01, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Sep 03, 2021	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Sep 03, 2021	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Sep 06, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

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IANZ # 1290

Company Name: Aargus Pty Ltd
Address: 6 Carter Street
Lidcombe
NSW 2141

Project Name: DSI GREENACRE
Project ID: ES8338

Order No.:
Report #: 821278
Phone: 02 9568 6159
Fax: 02 9566 6179

Received: Sep 1, 2021 7:23 PM
Due: Sep 8, 2021
Priority: 5 Day
Contact Name: - ALL INVOICES/SRA - Mark Kelly

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Metals M8	Suite B13: OCP/PCB	Moisture Set	Cation Exchange Capacity	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254												X			
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X									
Perth Laboratory - NATA Site # 23736															
Mayfield Laboratory - NATA Site # 25079															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	BH1 0.3-0.4	Aug 31, 2021		Soil	S21-Se02136					X	X		X		
2	BH1 0.5-0.6	Aug 31, 2021		Soil	S21-Se02137				X		X				
3	BH2 0.3-0.4	Aug 31, 2021		Soil	S21-Se02138					X	X		X		
4	BH3 0.2-0.3	Aug 31, 2021		Soil	S21-Se02139						X		X		
5	BH3 0.6-0.7	Aug 31, 2021		Soil	S21-Se02140	X		X	X		X	X			
6	BH4 0.2-0.4	Aug 31, 2021		Soil	S21-Se02141					X	X		X		
7	BH4 0.9-1.0	Aug 31, 2021		Soil	S21-Se02142				X		X				
8	BH5 0.2-0.5	Aug 31, 2021		Soil	S21-Se02143					X	X		X		
9	BH5 0.4-0.5	Aug 31, 2021		Soil	S21-Se02144				X		X				

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Company Name: Aargus Pty Ltd
Address: 6 Carter Street
Lidcombe
NSW 2141

Project Name: DSI GREENACRE
Project ID: ES8338

Order No.:
Report #: 821278
Phone: 02 9568 6159
Fax: 02 9566 6179

Received: Sep 1, 2021 7:23 PM
Due: Sep 8, 2021
Priority: 5 Day
Contact Name: - ALL INVOICES/SRA - Mark Kelly

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Metals M8	Suite B13: OCP/PCB	Moisture Set	Cation Exchange Capacity	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254												X			
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X									
Perth Laboratory - NATA Site # 23736															
Mayfield Laboratory - NATA Site # 25079															
External Laboratory															
10	BH6 0.2-0.6	Aug 31, 2021		Soil	S21-Se02145					X	X		X		
11	BH7 0.3-0.4	Aug 31, 2021		Soil	S21-Se02146					X	X		X		
12	BH7 0.8-0.9	Aug 31, 2021		Soil	S21-Se02147				X		X				
13	BH8 0.0-0.1	Aug 31, 2021		Soil	S21-Se02148					X	X		X		
14	BH8 0.3-0.4	Aug 31, 2021		Soil	S21-Se02149				X		X				
15	BH9 0.2-0.3	Aug 31, 2021		Soil	S21-Se02150						X		X		
16	BH10 0.3-0.4	Aug 31, 2021		Soil	S21-Se02151					X	X		X		
17	BH10 0.4-0.5	Aug 31, 2021		Soil	S21-Se02152				X		X				
18	BH11 0.2-0.3	Aug 31, 2021		Soil	S21-Se02153						X		X		
19	BH12 0.3-0.4	Aug 31, 2021		Soil	S21-Se02154						X		X		
20	BH12 0.5-0.6	Aug 31, 2021		Soil	S21-Se02155	X		X	X		X	X			

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Melbourne Laboratory - NATA Site # 1254												X			
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X									
Perth Laboratory - NATA Site # 23736															
Mayfield Laboratory - NATA Site # 25079															
External Laboratory															
21	BH13 0.2-0.3	Aug 31, 2021		Soil	S21-Se02156					X	X		X		
22	BH13 0.5-0.6	Aug 31, 2021		Soil	S21-Se02157				X		X				
23	BH14 0.2-0.3	Aug 31, 2021		Soil	S21-Se02158					X	X		X		
24	BH14 0.9-1.0	Aug 31, 2021		Soil	S21-Se02159				X		X				
25	BH15 0.1-0.2	Aug 31, 2021		Soil	S21-Se02160						X		X		
26	BH15 0.6-0.7	Aug 31, 2021		Soil	S21-Se02161				X		X				
27	BH16 0.2-0.3	Aug 31, 2021		Soil	S21-Se02162						X		X		
28	BH16 0.5-0.6	Aug 31, 2021		Soil	S21-Se02163				X		X				
29	BH17 0.1-0.2	Aug 31, 2021		Soil	S21-Se02164						X		X		
30	BH17 0.9-1.0	Aug 31, 2021		Soil	S21-Se02165				X		X				
31	BH18 0.1-0.2	Aug 31, 2021		Soil	S21-Se02166						X		X		

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Melbourne Laboratory - NATA Site # 1254												X			
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X									
Perth Laboratory - NATA Site # 23736															
Mayfield Laboratory - NATA Site # 25079															
External Laboratory															
32	BH18 0.8-0.9	Aug 31, 2021		Soil	S21-Se02167				X		X				
33	BH19 0.1-0.2	Aug 31, 2021		Soil	S21-Se02168						X		X		
34	BH19 0.6-0.7	Aug 31, 2021		Soil	S21-Se02169	X		X	X		X	X			
35	BH20 0.2-0.3	Aug 31, 2021		Soil	S21-Se02170						X		X		
36	BH20 0.5-0.6	Aug 31, 2021		Soil	S21-Se02171				X		X				
37	BH21 0.0-0.1	Aug 31, 2021		Soil	S21-Se02172						X		X		
38	BH22 0.1-0.2	Aug 31, 2021		Soil	S21-Se02173						X		X		
39	BH22 0.6-0.7	Aug 31, 2021		Soil	S21-Se02174				X		X				
40	BH23 0.1-0.2	Aug 31, 2021		Soil	S21-Se02175						X		X		
41	D1	Aug 31, 2021		Soil	S21-Se02176					X	X		X		
42	D2	Aug 31, 2021		Soil	S21-Se02177					X	X		X		

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Melbourne Laboratory - NATA Site # 1254												X			
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X									
Perth Laboratory - NATA Site # 23736															
Mayfield Laboratory - NATA Site # 25079															
External Laboratory															
43	TRIP SPIKE	Aug 31, 2021		Soil	S21-Se02178										X
44	TRIP BLANK	Aug 31, 2021		Soil	S21-Se02180									X	
45	RINSATE	Aug 31, 2021		Water	S21-Se02181								X		
46	BH2 0.5-0.6	Aug 31, 2021		Soil	S21-Se02182		X								
47	BH6 0.5-0.6	Aug 31, 2021		Soil	S21-Se02183		X								
48	BH9 0.5-0.6	Aug 31, 2021		Soil	S21-Se02184		X								
49	BH11 0.4-0.5	Aug 31, 2021		Soil	S21-Se02185		X								
50	BH21 0.4-0.5	Aug 31, 2021		Soil	S21-Se02186		X								
51	BH23 0.6-0.7	Aug 31, 2021		Soil	S21-Se02187		X								
Test Counts						3	6	3	17	12	42	3	26	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							
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	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
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	
TRH >C34-C40	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							
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							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	74			70-130	Pass	
TRH C10-C14	%	103			70-130	Pass	
Naphthalene	%	87			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C6-C10	%	76			70-130	Pass	
TRH >C10-C16	%	96			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	94			70-130	Pass	
Toluene	%	85			70-130	Pass	
Ethylbenzene	%	83			70-130	Pass	
m&p-Xylenes	%	72			70-130	Pass	
o-Xylene	%	93			70-130	Pass	
Xylenes - Total*	%	79			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	77			70-130	Pass	
Acenaphthylene	%	76			70-130	Pass	
Anthracene	%	88			70-130	Pass	
Benz(a)anthracene	%	84			70-130	Pass	
Benzo(a)pyrene	%	90			70-130	Pass	
Benzo(b&j)fluoranthene	%	86			70-130	Pass	
Benzo(g.h.i)perylene	%	84			70-130	Pass	
Benzo(k)fluoranthene	%	100			70-130	Pass	
Chrysene	%	90			70-130	Pass	
Dibenz(a.h)anthracene	%	83			70-130	Pass	
Fluoranthene	%	83			70-130	Pass	
Fluorene	%	88			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	87			70-130	Pass	
Naphthalene	%	79			70-130	Pass	
Phenanthrene	%	84			70-130	Pass	
Pyrene	%	84			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	97			80-120	Pass	
Cadmium	%	90			80-120	Pass	
Chromium	%	87			80-120	Pass	
Copper	%	80			80-120	Pass	
Lead	%	88			80-120	Pass	
Mercury	%	97			80-120	Pass	
Nickel	%	83			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	N21-Au54895	NCP	%	87			70-130	Pass	
TRH C10-C14	S21-Se02293	NCP	%	103			70-130	Pass	
Naphthalene	N21-Au54895	NCP	%	89			70-130	Pass	
TRH C6-C10	N21-Au54895	NCP	%	87			70-130	Pass	
TRH >C10-C16	S21-Se02293	NCP	%	97			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	N21-Au54895	NCP	%	106			70-130	Pass	
Toluene	N21-Au54895	NCP	%	93			70-130	Pass	
Ethylbenzene	N21-Au54895	NCP	%	90			70-130	Pass	
m&p-Xylenes	N21-Au54895	NCP	%	77			70-130	Pass	
o-Xylene	N21-Au54895	NCP	%	99			70-130	Pass	
Xylenes - Total*	N21-Au54895	NCP	%	84			70-130	Pass	
Spike - % Recovery									

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S21-Se02291	NCP	%	117			70-130	Pass	
Acenaphthylene	S21-Se02291	NCP	%	113			70-130	Pass	
Anthracene	N21-Au57056	NCP	%	128			70-130	Pass	
Benz(a)anthracene	S21-Se02291	NCP	%	115			70-130	Pass	
Benzo(a)pyrene	S21-Se02291	NCP	%	125			70-130	Pass	
Benzo(b&j)fluoranthene	S21-Se02291	NCP	%	121			70-130	Pass	
Benzo(g.h.i)perylene	S21-Se02291	NCP	%	117			70-130	Pass	
Chrysene	S21-Se02291	NCP	%	128			70-130	Pass	
Dibenz(a.h)anthracene	S21-Se02291	NCP	%	117			70-130	Pass	
Fluoranthene	S21-Se02291	NCP	%	121			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S21-Se02291	NCP	%	124			70-130	Pass	
Naphthalene	S21-Se02291	NCP	%	80			70-130	Pass	
Phenanthrene	S21-Se02291	NCP	%	126			70-130	Pass	
Pyrene	S21-Se02291	NCP	%	122			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S21-Se00919	NCP	%	83			75-125	Pass	
Cadmium	S21-Se00919	NCP	%	90			75-125	Pass	
Chromium	S21-Se00919	NCP	%	89			75-125	Pass	
Copper	S21-Se00919	NCP	%	90			75-125	Pass	
Lead	S21-Se00919	NCP	%	91			75-125	Pass	
Mercury	S21-Se00919	NCP	%	99			75-125	Pass	
Nickel	S21-Se00919	NCP	%	93			75-125	Pass	
Zinc	S21-Se00919	NCP	%	85			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	N21-Se00723	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	S21-Se02301	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	S21-Se02301	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	S21-Se02301	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Naphthalene	N21-Se00723	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	N21-Se00723	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH >C10-C16	S21-Se02301	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	S21-Se02301	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	S21-Se02301	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	N21-Se00723	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	N21-Se00723	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	N21-Se00723	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	N21-Se00723	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	N21-Se00723	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	N21-Se00723	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	N21-Au57062	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	N21-Au57062	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	N21-Au57062	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	N21-Au57062	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	N21-Au57062	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	N21-Au57062	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	N21-Au57062	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Benzo(k)fluoranthene	N21-Au57062	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	N21-Au57062	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	N21-Au57062	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	N21-Au57062	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	N21-Au57062	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	N21-Au57062	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	N21-Au57062	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	N21-Au57062	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	N21-Au57062	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S21-Se00918	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	S21-Se00918	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	S21-Se00918	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	S21-Se00918	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead	S21-Se00918	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury	S21-Se00918	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	S21-Se00918	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc	S21-Se00918	NCP	mg/L	< 0.005	< 0.005	<1	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

Authorised by:

Asim Khan	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
John Nguyen	Senior Analyst-Metal (NSW)
Roopesh Rangarajan	Senior Analyst-Volatile (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.

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Sample Receipt Advice

Company name:	Aargus Pty Ltd
Contact name:	- ALL INVOICES/SRA - Mark Kelly
Project name:	DSI GREENACRE
Project ID:	ES8338
Turnaround time:	5 Day
Date/Time received	Sep 1, 2021 7:23 PM
Eurofins reference	821278

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	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:

Asim Khan on phone : or by email: AsimKhan@eurofins.com

Results will be delivered electronically via email to - ALL INVOICES/SRA - Mark Kelly - mark.kelly@aargus.net.

Global Leader - Results you can trust

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Company Name: Aargus Pty Ltd
Address: 6 Carter Street
Lidcombe
NSW 2141

Project Name: DSI GREENACRE
Project ID: ES8338

Order No.:
Report #: 821278
Phone: 02 9568 6159
Fax: 02 9566 6179

Received: Sep 1, 2021 7:23 PM
Due: Sep 8, 2021
Priority: 5 Day
Contact Name: - ALL INVOICES/SRA - Mark Kelly

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Metals M8	Suite B13: OCP/PCB	Moisture Set	Cation Exchange Capacity	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254												X			
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X									
Perth Laboratory - NATA Site # 23736															
Mayfield Laboratory - NATA Site # 25079															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	BH1 0.3-0.4	Aug 31, 2021		Soil	S21-Se02136					X	X		X		
2	BH1 0.5-0.6	Aug 31, 2021		Soil	S21-Se02137				X		X				
3	BH2 0.3-0.4	Aug 31, 2021		Soil	S21-Se02138					X	X		X		
4	BH3 0.2-0.3	Aug 31, 2021		Soil	S21-Se02139						X		X		
5	BH3 0.6-0.7	Aug 31, 2021		Soil	S21-Se02140	X		X	X		X	X			
6	BH4 0.2-0.4	Aug 31, 2021		Soil	S21-Se02141					X	X		X		
7	BH4 0.9-1.0	Aug 31, 2021		Soil	S21-Se02142				X		X				
8	BH5 0.2-0.5	Aug 31, 2021		Soil	S21-Se02143					X	X		X		
9	BH5 0.4-0.5	Aug 31, 2021		Soil	S21-Se02144				X		X				

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Melbourne Laboratory - NATA Site # 1254												X			
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X									
Perth Laboratory - NATA Site # 23736															
Mayfield Laboratory - NATA Site # 25079															
External Laboratory															
10	BH6 0.2-0.6	Aug 31, 2021		Soil	S21-Se02145					X	X		X		
11	BH7 0.3-0.4	Aug 31, 2021		Soil	S21-Se02146					X	X		X		
12	BH7 0.8-0.9	Aug 31, 2021		Soil	S21-Se02147				X		X				
13	BH8 0.0-0.1	Aug 31, 2021		Soil	S21-Se02148					X	X		X		
14	BH8 0.3-0.4	Aug 31, 2021		Soil	S21-Se02149				X		X				
15	BH9 0.2-0.3	Aug 31, 2021		Soil	S21-Se02150						X		X		
16	BH10 0.3-0.4	Aug 31, 2021		Soil	S21-Se02151					X	X		X		
17	BH10 0.4-0.5	Aug 31, 2021		Soil	S21-Se02152				X		X				
18	BH11 0.2-0.3	Aug 31, 2021		Soil	S21-Se02153						X		X		
19	BH12 0.3-0.4	Aug 31, 2021		Soil	S21-Se02154						X		X		
20	BH12 0.5-0.6	Aug 31, 2021		Soil	S21-Se02155	X		X	X		X	X			

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Melbourne Laboratory - NATA Site # 1254												X			
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X									
Perth Laboratory - NATA Site # 23736															
Mayfield Laboratory - NATA Site # 25079															
External Laboratory															
21	BH13 0.2-0.3	Aug 31, 2021		Soil	S21-Se02156					X	X		X		
22	BH13 0.5-0.6	Aug 31, 2021		Soil	S21-Se02157				X		X				
23	BH14 0.2-0.3	Aug 31, 2021		Soil	S21-Se02158					X	X		X		
24	BH14 0.9-1.0	Aug 31, 2021		Soil	S21-Se02159				X		X				
25	BH15 0.1-0.2	Aug 31, 2021		Soil	S21-Se02160						X		X		
26	BH15 0.6-0.7	Aug 31, 2021		Soil	S21-Se02161				X		X				
27	BH16 0.2-0.3	Aug 31, 2021		Soil	S21-Se02162						X		X		
28	BH16 0.5-0.6	Aug 31, 2021		Soil	S21-Se02163				X		X				
29	BH17 0.1-0.2	Aug 31, 2021		Soil	S21-Se02164						X		X		
30	BH17 0.9-1.0	Aug 31, 2021		Soil	S21-Se02165				X		X				
31	BH18 0.1-0.2	Aug 31, 2021		Soil	S21-Se02166						X		X		

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Melbourne Laboratory - NATA Site # 1254												X			
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X									
Perth Laboratory - NATA Site # 23736															
Mayfield Laboratory - NATA Site # 25079															
External Laboratory															
32	BH18 0.8-0.9	Aug 31, 2021		Soil	S21-Se02167				X		X				
33	BH19 0.1-0.2	Aug 31, 2021		Soil	S21-Se02168						X		X		
34	BH19 0.6-0.7	Aug 31, 2021		Soil	S21-Se02169	X		X	X		X	X			
35	BH20 0.2-0.3	Aug 31, 2021		Soil	S21-Se02170						X		X		
36	BH20 0.5-0.6	Aug 31, 2021		Soil	S21-Se02171				X		X				
37	BH21 0.0-0.1	Aug 31, 2021		Soil	S21-Se02172						X		X		
38	BH22 0.1-0.2	Aug 31, 2021		Soil	S21-Se02173						X		X		
39	BH22 0.6-0.7	Aug 31, 2021		Soil	S21-Se02174				X		X				
40	BH23 0.1-0.2	Aug 31, 2021		Soil	S21-Se02175						X		X		
41	D1	Aug 31, 2021		Soil	S21-Se02176					X	X		X		
42	D2	Aug 31, 2021		Soil	S21-Se02177					X	X		X		

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Eurofins Analytical Services Manager : Asim Khan

Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Metals M8	Suite B13: OCP/PCB	Moisture Set	Cation Exchange Capacity	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254												X			
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X									
Perth Laboratory - NATA Site # 23736															
Mayfield Laboratory - NATA Site # 25079															
External Laboratory															
43	TRIP SPIKE	Aug 31, 2021		Soil	S21-Se02178										X
44	TRIP BLANK	Aug 31, 2021		Soil	S21-Se02180									X	
45	RINSATE	Aug 31, 2021		Water	S21-Se02181								X		
46	BH2 0.5-0.6	Aug 31, 2021		Soil	S21-Se02182		X								
47	BH6 0.5-0.6	Aug 31, 2021		Soil	S21-Se02183		X								
48	BH9 0.5-0.6	Aug 31, 2021		Soil	S21-Se02184		X								
49	BH11 0.4-0.5	Aug 31, 2021		Soil	S21-Se02185		X								
50	BH21 0.4-0.5	Aug 31, 2021		Soil	S21-Se02186		X								
51	BH23 0.6-0.7	Aug 31, 2021		Soil	S21-Se02187		X								
Test Counts						3	6	3	17	12	42	3	26	1	1

Aargus Pty Ltd
6 Carter Street
Lidcombe
NSW 2141

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **- ALL INVOICES/SRA - Mark Kelly**

Report **821278-S**
Project name DSI GREENACRE
Project ID ES8338
Received Date Sep 01, 2021

Client Sample ID			**BH1 0.3-0.4**	**BH1 0.5-0.6**	[G01]**BH2 0.3-0.4**	[G01]**BH3 0.2-0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S21-Se02136**	**S21-Se02137**	**S21-Se02138**	**S21-Se02139**
Date Sampled			**Aug 31, 2021**	**Aug 31, 2021**	**Aug 31, 2021**	**Aug 31, 2021**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	-	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	-	< 100	< 100
TRH C15-C28	50	mg/kg	< 50	-	< 250	< 250
TRH C29-C36	50	mg/kg	< 50	-	< 250	< 250
TRH C10-C36 (Total)	50	mg/kg	< 50	-	< 250	< 250
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	-	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	-	< 250	< 250
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	< 250	< 250
TRH >C16-C34	100	mg/kg	< 100	-	< 500	< 500
TRH >C34-C40	100	mg/kg	< 100	-	< 500	< 500
TRH >C10-C40 (total)*	100	mg/kg	< 100	-	< 500	< 500
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	-	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	91	-	90	92
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5

Client Sample ID			BH1 0.3-0.4	BH1 0.5-0.6	[G01]BH2 0.3-0.4	[G01]BH3 0.2-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02136	S21-Se02137	S21-Se02138	S21-Se02139
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	98	-	87	93
p-Terphenyl-d14 (surr.)	1	%	84	-	58	67
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.5	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.5	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.5	-
a-HCH	0.05	mg/kg	< 0.05	-	< 0.5	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.5	-
b-HCH	0.05	mg/kg	< 0.05	-	< 0.5	-
d-HCH	0.05	mg/kg	< 0.05	-	< 0.5	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.5	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.5	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.5	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.5	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.5	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.5	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.5	-
g-HCH (Lindane)	0.05	mg/kg	< 0.05	-	< 0.5	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.5	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.5	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.5	-
Methoxychlor	0.05	mg/kg	< 0.05	-	< 0.5	-
Toxaphene	0.5	mg/kg	< 0.5	-	< 10	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.5	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	< 0.5	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	< 1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	< 1	-
Dibutylchlorendate (surr.)	1	%	87	-	INT	-
Tetrachloro-m-xylene (surr.)	1	%	89	-	82	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	-	< 1	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	< 1	-
Aroclor-1232	0.1	mg/kg	< 0.1	-	< 1	-
Aroclor-1242	0.1	mg/kg	< 0.1	-	< 1	-
Aroclor-1248	0.1	mg/kg	< 0.1	-	< 1	-
Aroclor-1254	0.1	mg/kg	< 0.1	-	< 1	-
Aroclor-1260	0.1	mg/kg	< 0.1	-	< 1	-
Total PCB*	0.1	mg/kg	< 0.1	-	< 1	-
Dibutylchlorendate (surr.)	1	%	87	-	INT	-
Tetrachloro-m-xylene (surr.)	1	%	89	-	82	-

Client Sample ID			BH1 0.3-0.4	BH1 0.5-0.6	[G01]BH2 0.3-0.4	[G01]BH3 0.2-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02136	S21-Se02137	S21-Se02138	S21-Se02139
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	6.2	4.7	3.0	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	24	10.0	23	7.3
Copper	5	mg/kg	27	33	25	15
Lead	5	mg/kg	19	18	13	130
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	13	10	23	6.5
Zinc	5	mg/kg	45	68	40	72
% Moisture	1	%	21	21	13	25

Client Sample ID			BH3 0.6-0.7	BH4 0.2-0.4	BH4 0.9-1.0	BH5 0.2-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02140	S21-Se02141	S21-Se02142	S21-Se02143
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	< 20	-	< 20
TRH C10-C14	20	mg/kg	-	< 20	-	< 20
TRH C15-C28	50	mg/kg	-	61	-	79
TRH C29-C36	50	mg/kg	-	< 50	-	54
TRH C10-C36 (Total)	50	mg/kg	-	61	-	133
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	-	< 0.5
TRH C6-C10	20	mg/kg	-	< 20	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	-	< 20
TRH >C10-C16	50	mg/kg	-	< 50	-	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	-	< 50
TRH >C16-C34	100	mg/kg	-	100	-	120
TRH >C34-C40	100	mg/kg	-	< 100	-	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	100	-	120
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1	-	< 0.1
Xylenes - Total*	0.3	mg/kg	-	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	93	-	98
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	-	1.0
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	-	1.3
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	-	1.6
Acenaphthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	0.7
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	0.8
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5	-	0.6

Client Sample ID			BH3 0.6-0.7	BH4 0.2-0.4	BH4 0.9-1.0	BH5 0.2-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02140	S21-Se02141	S21-Se02142	S21-Se02143
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	0.9
Chrysene	0.5	mg/kg	-	< 0.5	-	0.8
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Fluoranthene	0.5	mg/kg	-	< 0.5	-	1.4
Fluorene	0.5	mg/kg	-	< 0.5	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Naphthalene	0.5	mg/kg	-	< 0.5	-	< 0.5
Phenanthrene	0.5	mg/kg	-	< 0.5	-	0.6
Pyrene	0.5	mg/kg	-	< 0.5	-	1.5
Total PAH*	0.5	mg/kg	-	< 0.5	-	7.3
2-Fluorobiphenyl (surr.)	1	%	-	89	-	90
p-Terphenyl-d14 (surr.)	1	%	-	65	-	60
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	< 0.05
a-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
Aldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
b-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
d-HCH	0.05	mg/kg	-	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	< 0.05
Methoxychlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Toxaphene	0.5	mg/kg	-	< 0.5	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	61	-	61
Tetrachloro-m-xylene (surr.)	1	%	-	76	-	79
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1232	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1242	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1248	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1254	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1260	0.1	mg/kg	-	< 0.1	-	< 0.1

Client Sample ID			BH3 0.6-0.7	BH4 0.2-0.4	BH4 0.9-1.0	BH5 0.2-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02140	S21-Se02141	S21-Se02142	S21-Se02143
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Total PCB*	0.1	mg/kg	-	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	61	-	61
Tetrachloro-m-xylene (surr.)	1	%	-	76	-	79
Heavy Metals						
Arsenic	2	mg/kg	3.9	6.4	6.6	76
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	11	24	19	35
Copper	5	mg/kg	23	25	27	18
Lead	5	mg/kg	24	53	13	320
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	6.0	18	12	12
Zinc	5	mg/kg	48	110	57	56
% Moisture	1	%	18	14	16	20
% Clay	1	%	27	-	-	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	65	-	-	-
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	5.7	-	-	-
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	17	-	-	-

Client Sample ID			BH5 0.4-0.5	BH6 0.2-0.6	[G01]BH7 0.3-0.4	BH7 0.8-0.9
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02144	S21-Se02145	S21-Se02146	S21-Se02147
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	< 20	< 20	-
TRH C10-C14	20	mg/kg	-	< 20	< 100	-
TRH C15-C28	50	mg/kg	-	< 50	280	-
TRH C29-C36	50	mg/kg	-	< 50	< 250	-
TRH C10-C36 (Total)	50	mg/kg	-	< 50	280	-
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	< 0.5	-
TRH C6-C10	20	mg/kg	-	< 20	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	< 20	-
TRH >C10-C16	50	mg/kg	-	< 50	< 250	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	< 250	-
TRH >C16-C34	100	mg/kg	-	< 100	< 500	-
TRH >C34-C40	100	mg/kg	-	< 100	< 500	-
TRH >C10-C40 (total)*	100	mg/kg	-	< 100	< 500	-
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	< 0.1	-
Toluene	0.1	mg/kg	-	< 0.1	< 0.1	-
Ethylbenzene	0.1	mg/kg	-	< 0.1	< 0.1	-
m&p-Xylenes	0.2	mg/kg	-	< 0.2	< 0.2	-
o-Xylene	0.1	mg/kg	-	< 0.1	< 0.1	-
Xylenes - Total*	0.3	mg/kg	-	< 0.3	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	-	92	90	-

Client Sample ID			BH5 0.4-0.5	BH6 0.2-0.6	[G01]BH7 0.3-0.4	BH7 0.8-0.9
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02144	S21-Se02145	S21-Se02146	S21-Se02147
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	1.2	-
Acenaphthene	0.5	mg/kg	-	< 0.5	< 0.5	-
Acenaphthylene	0.5	mg/kg	-	< 0.5	< 0.5	-
Anthracene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	< 0.5	-
Chrysene	0.5	mg/kg	-	< 0.5	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	< 0.5	-
Fluoranthene	0.5	mg/kg	-	< 0.5	< 0.5	-
Fluorene	0.5	mg/kg	-	< 0.5	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Naphthalene	0.5	mg/kg	-	< 0.5	< 0.5	-
Phenanthrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Pyrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Total PAH*	0.5	mg/kg	-	< 0.5	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	-	98	77	-
p-Terphenyl-d14 (surr.)	1	%	-	81	53	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	< 1	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	< 0.5	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	< 0.5	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	< 0.5	-
a-HCH	0.05	mg/kg	-	< 0.05	< 0.5	-
Aldrin	0.05	mg/kg	-	< 0.05	< 0.5	-
b-HCH	0.05	mg/kg	-	< 0.05	< 0.5	-
d-HCH	0.05	mg/kg	-	< 0.05	< 0.5	-
Dieldrin	0.05	mg/kg	-	< 0.05	< 0.5	-
Endosulfan I	0.05	mg/kg	-	< 0.05	< 0.5	-
Endosulfan II	0.05	mg/kg	-	< 0.05	< 0.5	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	< 0.5	-
Endrin	0.05	mg/kg	-	< 0.05	< 0.5	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	< 0.5	-
Endrin ketone	0.05	mg/kg	-	< 0.05	< 0.5	-
g-HCH (Lindane)	0.05	mg/kg	-	< 0.05	< 0.5	-
Heptachlor	0.05	mg/kg	-	< 0.05	< 0.5	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	< 0.5	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	< 0.5	-
Methoxychlor	0.05	mg/kg	-	< 0.05	< 0.5	-
Toxaphene	0.5	mg/kg	-	< 0.5	< 10	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	< 0.5	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	< 0.5	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	< 1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	< 1	-
Dibutylchlorendate (surr.)	1	%	-	106	INT	-
Tetrachloro-m-xylene (surr.)	1	%	-	92	77	-

Client Sample ID			BH5 0.4-0.5	BH6 0.2-0.6	[G01]BH7 0.3-0.4	BH7 0.8-0.9
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02144	S21-Se02145	S21-Se02146	S21-Se02147
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	< 0.1	< 1	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	< 1	-
Aroclor-1232	0.1	mg/kg	-	< 0.1	< 1	-
Aroclor-1242	0.1	mg/kg	-	< 0.1	< 1	-
Aroclor-1248	0.1	mg/kg	-	< 0.1	< 1	-
Aroclor-1254	0.1	mg/kg	-	< 0.1	< 1	-
Aroclor-1260	0.1	mg/kg	-	< 0.1	< 1	-
Total PCB*	0.1	mg/kg	-	< 0.1	< 1	-
Dibutylchlorendate (surr.)	1	%	-	106	INT	-
Tetrachloro-m-xylene (surr.)	1	%	-	92	77	-
Heavy Metals						
Arsenic	2	mg/kg	11	5.2	2.1	2.9
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	21	22	29	7.7
Copper	5	mg/kg	25	18	26	20
Lead	5	mg/kg	15	18	19	17
Mercury	0.1	mg/kg	< 0.1	0.2	< 0.1	< 0.1
Nickel	5	mg/kg	6.2	11	37	8.2
Zinc	5	mg/kg	38	41	55	72
% Moisture	1	%	23	17	10	20

Client Sample ID			[G01]BH8 0.0-0.1	BH8 0.3-0.4	BH9 0.2-0.3	BH10 0.3-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02148	S21-Se02149	S21-Se02150	S21-Se02151
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	-	< 20	< 20
TRH C10-C14	20	mg/kg	< 100	-	< 20	< 20
TRH C15-C28	50	mg/kg	610	-	< 50	62
TRH C29-C36	50	mg/kg	540	-	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	1150	-	< 50	62
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	-	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	< 20	< 20
TRH >C10-C16	50	mg/kg	< 250	-	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 250	-	< 50	< 50
TRH >C16-C34	100	mg/kg	< 500	-	< 100	< 100
TRH >C34-C40	100	mg/kg	< 500	-	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 500	-	< 100	< 100
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	-	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	85	-	91	94

Client Sample ID			[G01]BH8 0.0-0.1	BH8 0.3-0.4	BH9 0.2-0.3	BH10 0.3-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02148	S21-Se02149	S21-Se02150	S21-Se02151
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	73	-	89	80
p-Terphenyl-d14 (surr.)	1	%	52	-	73	78
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 1	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.5	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.5	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.5	-	-	< 0.05
a-HCH	0.05	mg/kg	< 0.5	-	-	< 0.05
Aldrin	0.05	mg/kg	< 0.5	-	-	< 0.05
b-HCH	0.05	mg/kg	< 0.5	-	-	< 0.05
d-HCH	0.05	mg/kg	< 0.5	-	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.5	-	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.5	-	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.5	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.5	-	-	< 0.05
Endrin	0.05	mg/kg	< 0.5	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.5	-	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.5	-	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.5	-	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.5	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.5	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.5	-	-	< 0.05
Methoxychlor	0.05	mg/kg	< 0.5	-	-	< 0.05
Toxaphene	0.5	mg/kg	< 10	-	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.5	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.5	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 1	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 1	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	51	-	-	59
Tetrachloro-m-xylene (surr.)	1	%	71	-	-	79

Client Sample ID			[G01]BH8 0.0-0.1	BH8 0.3-0.4	BH9 0.2-0.3	BH10 0.3-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02148	S21-Se02149	S21-Se02150	S21-Se02151
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 1	-	-	< 0.1
Aroclor-1221	0.1	mg/kg	< 1	-	-	< 0.1
Aroclor-1232	0.1	mg/kg	< 1	-	-	< 0.1
Aroclor-1242	0.1	mg/kg	< 1	-	-	< 0.1
Aroclor-1248	0.1	mg/kg	< 1	-	-	< 0.1
Aroclor-1254	0.1	mg/kg	< 1	-	-	< 0.1
Aroclor-1260	0.1	mg/kg	< 1	-	-	< 0.1
Total PCB*	0.1	mg/kg	< 1	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	51	-	-	59
Tetrachloro-m-xylene (surr.)	1	%	71	-	-	79
Heavy Metals						
Arsenic	2	mg/kg	< 2	4.5	4.4	4.0
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	180	16	17	63
Copper	5	mg/kg	43	32	18	34
Lead	5	mg/kg	20	18	23	12
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	7.5	< 5	8.5	58
Zinc	5	mg/kg	270	31	98	98
% Moisture	1	%	48	15	17	16

Client Sample ID			BH10 0.4-0.5	BH11 0.2-0.3	BH12 0.3-0.4	BH12 0.5-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02152	S21-Se02153	S21-Se02154	S21-Se02155
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	< 20	< 20	-
TRH C10-C14	20	mg/kg	-	< 20	< 20	-
TRH C15-C28	50	mg/kg	-	< 50	< 50	-
TRH C29-C36	50	mg/kg	-	< 50	< 50	-
TRH C10-C36 (Total)	50	mg/kg	-	< 50	< 50	-
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	< 0.5	-
TRH C6-C10	20	mg/kg	-	< 20	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	< 20	-
TRH >C10-C16	50	mg/kg	-	< 50	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	< 50	-
TRH >C16-C34	100	mg/kg	-	< 100	< 100	-
TRH >C34-C40	100	mg/kg	-	< 100	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	-	< 100	< 100	-
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	< 0.1	-
Toluene	0.1	mg/kg	-	< 0.1	< 0.1	-
Ethylbenzene	0.1	mg/kg	-	< 0.1	< 0.1	-
m&p-Xylenes	0.2	mg/kg	-	< 0.2	< 0.2	-
o-Xylene	0.1	mg/kg	-	< 0.1	< 0.1	-
Xylenes - Total*	0.3	mg/kg	-	< 0.3	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	-	94	94	-

Client Sample ID			BH10 0.4-0.5	BH11 0.2-0.3	BH12 0.3-0.4	BH12 0.5-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02152	S21-Se02153	S21-Se02154	S21-Se02155
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	1.2	-
Acenaphthene	0.5	mg/kg	-	< 0.5	< 0.5	-
Acenaphthylene	0.5	mg/kg	-	< 0.5	< 0.5	-
Anthracene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	< 0.5	-
Chrysene	0.5	mg/kg	-	< 0.5	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	< 0.5	-
Fluoranthene	0.5	mg/kg	-	< 0.5	< 0.5	-
Fluorene	0.5	mg/kg	-	< 0.5	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Naphthalene	0.5	mg/kg	-	< 0.5	< 0.5	-
Phenanthrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Pyrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Total PAH*	0.5	mg/kg	-	< 0.5	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	-	89	93	-
p-Terphenyl-d14 (surr.)	1	%	-	74	78	-
Heavy Metals						
Arsenic	2	mg/kg	4.7	8.5	4.7	8.0
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	16	22	44	20
Copper	5	mg/kg	19	19	25	23
Lead	5	mg/kg	24	24	12	12
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	5.5	7.9	37	9.1
Zinc	5	mg/kg	30	42	64	52
% Moisture	1	%	17	19	16	21
% Clay	1	%	-	-	-	32
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	-	-	110
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	-	-	6.5
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	-	-	14

Client Sample ID			[G01]BH13 0.2-0.3	BH13 0.5-0.6	BH14 0.2-0.3	BH14 0.9-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02156	S21-Se02157	S21-Se02158	S21-Se02159
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	-	< 20	-
TRH C10-C14	20	mg/kg	< 100	-	26	-
TRH C15-C28	50	mg/kg	< 250	-	170	-
TRH C29-C36	50	mg/kg	< 250	-	140	-
TRH C10-C36 (Total)	50	mg/kg	< 250	-	336	-
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	< 0.5	-
TRH C6-C10	20	mg/kg	< 20	-	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	< 20	-
TRH >C10-C16	50	mg/kg	< 250	-	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 250	-	< 50	-
TRH >C16-C34	100	mg/kg	< 500	-	280	-
TRH >C34-C40	100	mg/kg	< 500	-	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	< 500	-	280	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	-
Xylenes - Total*	0.3	mg/kg	< 0.3	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	91	-	105	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PAH*	0.5	mg/kg	< 0.5	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	80	-	84	-
p-Terphenyl-d14 (surr.)	1	%	52	-	65	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.5	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.5	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.5	-	< 0.05	-

Client Sample ID			[G01]BH13 0.2-0.3	BH13 0.5-0.6	BH14 0.2-0.3	BH14 0.9-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02156	S21-Se02157	S21-Se02158	S21-Se02159
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
a-HCH	0.05	mg/kg	< 0.5	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.5	-	< 0.05	-
b-HCH	0.05	mg/kg	< 0.5	-	< 0.05	-
d-HCH	0.05	mg/kg	< 0.5	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.5	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.5	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.5	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.5	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.5	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.5	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.5	-	< 0.05	-
g-HCH (Lindane)	0.05	mg/kg	< 0.5	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.5	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.5	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.5	-	< 0.05	-
Methoxychlor	0.05	mg/kg	< 0.5	-	< 0.05	-
Toxaphene	0.5	mg/kg	< 10	-	< 0.5	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.5	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.5	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 1	-	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 1	-	< 0.1	-
Dibutylchlorendate (surr.)	1	%	INT	-	71	-
Tetrachloro-m-xylene (surr.)	1	%	73	-	78	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 1	-	< 0.1	-
Aroclor-1221	0.1	mg/kg	< 1	-	< 0.1	-
Aroclor-1232	0.1	mg/kg	< 1	-	< 0.1	-
Aroclor-1242	0.1	mg/kg	< 1	-	< 0.1	-
Aroclor-1248	0.1	mg/kg	< 1	-	< 0.1	-
Aroclor-1254	0.1	mg/kg	< 1	-	< 0.1	-
Aroclor-1260	0.1	mg/kg	< 1	-	< 0.1	-
Total PCB*	0.1	mg/kg	< 1	-	< 0.1	-
Dibutylchlorendate (surr.)	1	%	INT	-	71	-
Tetrachloro-m-xylene (surr.)	1	%	73	-	78	-
Heavy Metals						
Arsenic	2	mg/kg	2.5	6.3	3.3	7.5
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	17	24	13	25
Copper	5	mg/kg	26	22	18	22
Lead	5	mg/kg	78	16	17	17
Mercury	0.1	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	24	7.9	12	7.9
Zinc	5	mg/kg	76	47	60	49
% Moisture	1	%	13	22	16	22

Client Sample ID			BH15 0.1-0.2	BH15 0.6-0.7	BH16 0.2-0.3	BH16 0.5-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02160	S21-Se02161	S21-Se02162	S21-Se02163
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	-	< 20	-
TRH C10-C14	20	mg/kg	< 20	-	< 20	-
TRH C15-C28	50	mg/kg	50	-	94	-
TRH C29-C36	50	mg/kg	< 50	-	< 50	-
TRH C10-C36 (Total)	50	mg/kg	50	-	94	-
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	< 0.5	-
TRH C6-C10	20	mg/kg	< 20	-	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	< 20	-
TRH >C10-C16	50	mg/kg	< 50	-	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	< 50	-
TRH >C16-C34	100	mg/kg	< 100	-	150	-
TRH >C34-C40	100	mg/kg	< 100	-	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	-	150	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	-
Xylenes - Total*	0.3	mg/kg	< 0.3	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	107	-	100	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PAH*	0.5	mg/kg	< 0.5	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	85	-	87	-
p-Terphenyl-d14 (surr.)	1	%	62	-	88	-
Heavy Metals						
Arsenic	2	mg/kg	2.8	3.8	3.7	4.9
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	12	11	18	17
Copper	5	mg/kg	20	12	16	17

Client Sample ID			BH15 0.1-0.2	BH15 0.6-0.7	BH16 0.2-0.3	BH16 0.5-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02160	S21-Se02161	S21-Se02162	S21-Se02163
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	45	26	24	13
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	14	5.9	13	7.6
Zinc	5	mg/kg	88	40	49	37
% Moisture	1	%	15	20	14	22

Client Sample ID			BH17 0.1-0.2	BH17 0.9-1.0	BH18 0.1-0.2	BH18 0.8-0.9
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02164	S21-Se02165	S21-Se02166	S21-Se02167
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	-	< 20	-
TRH C10-C14	20	mg/kg	< 20	-	< 20	-
TRH C15-C28	50	mg/kg	< 50	-	68	-
TRH C29-C36	50	mg/kg	< 50	-	< 50	-
TRH C10-C36 (Total)	50	mg/kg	< 50	-	68	-
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	< 0.5	-
TRH C6-C10	20	mg/kg	< 20	-	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	< 20	-
TRH >C10-C16	50	mg/kg	< 50	-	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	< 50	-
TRH >C16-C34	100	mg/kg	< 100	-	130	-
TRH >C34-C40	100	mg/kg	< 100	-	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	-	130	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	-
Xylenes - Total*	0.3	mg/kg	< 0.3	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	88	-	116	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-

Client Sample ID			BH17 0.1-0.2	BH17 0.9-1.0	BH18 0.1-0.2	BH18 0.8-0.9
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02164	S21-Se02165	S21-Se02166	S21-Se02167
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PAH*	0.5	mg/kg	< 0.5	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	84	-	106	-
p-Terphenyl-d14 (surr.)	1	%	83	-	98	-
Heavy Metals						
Arsenic	2	mg/kg	3.6	7.0	< 2	6.6
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	6.7	15	6.1	18
Copper	5	mg/kg	9.5	21	13	21
Lead	5	mg/kg	26	15	16	20
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	5.6	6.0	< 5	9.7
Zinc	5	mg/kg	36	31	36	43
% Moisture	1	%	12	19	5.1	20

Client Sample ID			BH19 0.1-0.2	BH19 0.6-0.7	BH20 0.2-0.3	BH20 0.5-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02168	S21-Se02169	S21-Se02170	S21-Se02171
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	-	< 20	-
TRH C10-C14	20	mg/kg	< 20	-	< 20	-
TRH C15-C28	50	mg/kg	55	-	< 50	-
TRH C29-C36	50	mg/kg	< 50	-	< 50	-
TRH C10-C36 (Total)	50	mg/kg	55	-	< 50	-
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	< 0.5	-
TRH C6-C10	20	mg/kg	< 20	-	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	< 20	-
TRH >C10-C16	50	mg/kg	< 50	-	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	< 50	-
TRH >C16-C34	100	mg/kg	110	-	< 100	-
TRH >C34-C40	100	mg/kg	< 100	-	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	110	-	< 100	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	-
Xylenes - Total*	0.3	mg/kg	< 0.3	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	102	-	102	-

Client Sample ID			BH19 0.1-0.2	BH19 0.6-0.7	BH20 0.2-0.3	BH20 0.5-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02168	S21-Se02169	S21-Se02170	S21-Se02171
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Fluoranthene	0.5	mg/kg	0.7	-	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Pyrene	0.5	mg/kg	0.8	-	< 0.5	-
Total PAH*	0.5	mg/kg	1.5	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	92	-	91	-
p-Terphenyl-d14 (surr.)	1	%	75	-	80	-
Heavy Metals						
Arsenic	2	mg/kg	4.0	3.9	3.7	9.9
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	12	15	13	29
Copper	5	mg/kg	23	32	21	19
Lead	5	mg/kg	84	84	16	19
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	11	11	< 5	6.3
Zinc	5	mg/kg	130	220	26	31
% Moisture	1	%	17	20	16	20
% Clay	1	%	-	19	-	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	47	-	-
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	7.1	-	-
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	18	-	-

Client Sample ID			BH21 0.0-0.1	BH22 0.1-0.2	BH22 0.6-0.7	[G01]BH23 0.1-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02172	S21-Se02173	S21-Se02174	S21-Se02175
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	< 20	-	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	-	< 100
TRH C15-C28	50	mg/kg	< 50	< 50	-	360
TRH C29-C36	50	mg/kg	< 50	< 50	-	< 250
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	-	360
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	-	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	-	< 250
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	-	< 250
TRH >C16-C34	100	mg/kg	< 100	< 100	-	620
TRH >C34-C40	100	mg/kg	< 100	< 100	-	< 500
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	-	620
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	90	91	-	97
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	-	1.0
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	-	1.3
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	-	1.6
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	0.7
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	0.8
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	-	0.6
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	0.8
Chrysene	0.5	mg/kg	< 0.5	< 0.5	-	0.7
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	1.1
Fluorene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	-	1.2
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	-	5.9
2-Fluorobiphenyl (surr.)	1	%	92	96	-	65
p-Terphenyl-d14 (surr.)	1	%	77	82	-	64
Heavy Metals						
Arsenic	2	mg/kg	4.8	2.7	7.5	6.7
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	11	13	7.8	11
Copper	5	mg/kg	25	17	19	39

Client Sample ID			BH21 0.0-0.1	BH22 0.1-0.2	BH22 0.6-0.7	[G01]BH23 0.1-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02172	S21-Se02173	S21-Se02174	S21-Se02175
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	25	14	13	90
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	12	13	< 5	20
Zinc	5	mg/kg	74	43	17	170
% Moisture	1	%	16	15	17	8.0

Client Sample ID			[G01]D1	D2	TRIP SPIKE	TRIP BLANK
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02176	S21-Se02177	S21-Se02178	S21-Se02180
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	< 20	-	< 20
TRH C10-C14	20	mg/kg	< 100	< 20	-	-
TRH C15-C28	50	mg/kg	< 250	< 50	-	-
TRH C29-C36	50	mg/kg	< 250	< 50	-	-
TRH C10-C36 (Total)	50	mg/kg	< 250	< 50	-	-
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	-	< 20
TRH >C10-C16	50	mg/kg	< 250	< 50	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 250	< 50	-	-
TRH >C16-C34	100	mg/kg	< 500	< 100	-	-
TRH >C34-C40	100	mg/kg	< 500	< 100	-	-
TRH >C10-C40 (total)*	100	mg/kg	< 500	< 100	-	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	90	90	-	97
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	-	-
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	-	-
Anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Chrysene	0.5	mg/kg	< 0.5	< 0.5	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-

Client Sample ID			[G01]D1	D2	TRIP SPIKE	TRIP BLANK
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Se02176	S21-Se02177	S21-Se02178	S21-Se02180
Date Sampled			Aug 31, 2021	Aug 31, 2021	Aug 31, 2021	Aug 31, 2021
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Fluorene	0.5	mg/kg	< 0.5	< 0.5	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	-	-
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	-	-
2-Fluorobiphenyl (surr.)	1	%	75	92	-	-
p-Terphenyl-d14 (surr.)	1	%	56	76	-	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 1	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	< 0.5	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	< 0.5	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	< 0.5	< 0.05	-	-
a-HCH	0.05	mg/kg	< 0.5	< 0.05	-	-
Aldrin	0.05	mg/kg	< 0.5	< 0.05	-	-
b-HCH	0.05	mg/kg	< 0.5	< 0.05	-	-
d-HCH	0.05	mg/kg	< 0.5	< 0.05	-	-
Dieldrin	0.05	mg/kg	< 0.5	< 0.05	-	-
Endosulfan I	0.05	mg/kg	< 0.5	< 0.05	-	-
Endosulfan II	0.05	mg/kg	< 0.5	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.5	< 0.05	-	-
Endrin	0.05	mg/kg	< 0.5	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	< 0.5	< 0.05	-	-
Endrin ketone	0.05	mg/kg	< 0.5	< 0.05	-	-
g-HCH (Lindane)	0.05	mg/kg	< 0.5	< 0.05	-	-
Heptachlor	0.05	mg/kg	< 0.5	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.5	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.5	< 0.05	-	-
Methoxychlor	0.05	mg/kg	< 0.5	< 0.05	-	-
Toxaphene	0.5	mg/kg	< 10	< 0.5	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.5	< 0.05	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.5	< 0.05	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 1	< 0.1	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 1	< 0.1	-	-
Dibutylchlorendate (surr.)	1	%	80	104	-	-
Tetrachloro-m-xylene (surr.)	1	%	79	88	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 1	< 0.1	-	-
Aroclor-1221	0.1	mg/kg	< 1	< 0.1	-	-
Aroclor-1232	0.1	mg/kg	< 1	< 0.1	-	-
Aroclor-1242	0.1	mg/kg	< 1	< 0.1	-	-
Aroclor-1248	0.1	mg/kg	< 1	< 0.1	-	-
Aroclor-1254	0.1	mg/kg	< 1	< 0.1	-	-
Aroclor-1260	0.1	mg/kg	< 1	< 0.1	-	-
Total PCB*	0.1	mg/kg	< 1	< 0.1	-	-
Dibutylchlorendate (surr.)	1	%	80	104	-	-
Tetrachloro-m-xylene (surr.)	1	%	79	88	-	-

Client Sample ID			[G01]D1	D2	TRIP SPIKE	TRIP BLANK
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S21-Se02176**	**S21-Se02177**	**S21-Se02178**	**S21-Se02180**
Date Sampled			**Aug 31, 2021**	**Aug 31, 2021**	**Aug 31, 2021**	**Aug 31, 2021**
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	4.1	6.6	-	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	-	-
Chromium	5	mg/kg	32	33	-	-
Copper	5	mg/kg	39	33	-	-
Lead	5	mg/kg	17	28	-	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	-	-
Nickel	5	mg/kg	53	27	-	-
Zinc	5	mg/kg	63	81	-	-
% Moisture	1	%	12	13	-	-
TRH C6-C10	1	%	-	-	93	-
Total Recoverable Hydrocarbons						
Naphthalene	1	%	-	-	88	-
TRH C6-C9	1	%	-	-	94	-
BTEX						
Benzene	1	%	-	-	90	-
Ethylbenzene	1	%	-	-	93	-
m&p-Xylenes	1	%	-	-	92	-
o-Xylene	1	%	-	-	93	-
Toluene	1	%	-	-	95	-
Xylenes - Total	1	%	-	-	93	-
4-Bromofluorobenzene (surr.)	1	%	-	-	94	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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	Sep 03, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Sep 03, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons	Sydney	Sep 03, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Sep 03, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Sep 03, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Sep 07, 2021	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Sep 03, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Organochlorine Pesticides	Sydney	Sep 03, 2021	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Sydney	Sep 03, 2021	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
% Moisture	Sydney	Sep 01, 2021	14 Days
- Method: LTM-GEN-7080 Moisture			
% Clay	Brisbane	Sep 06, 2021	14 Days
- Method: LTM-GEN-7040			
pH (1:5 Aqueous extract at 25°C as rec.)	Sydney	Sep 03, 2021	7 Days
- Method: LTM-GEN-7090 pH by ISE			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Sydney	Sep 03, 2021	7 Days
- Method: LTM-INO-4030 Conductivity			
Cation Exchange Capacity	Melbourne	Sep 04, 2021	180 Days
- Method: LTM-MET-3060 Cation Exchange Capacity by bases & Exchangeable Sodium Percentage			

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Company Name: Aargus Pty Ltd
Address: 6 Carter Street
Lidcombe
NSW 2141

Project Name: DSI GREENACRE
Project ID: ES8338

Order No.:
Report #: 821278
Phone: 02 9568 6159
Fax: 02 9566 6179

Received: Sep 1, 2021 7:23 PM
Due: Sep 8, 2021
Priority: 5 Day
Contact Name: - ALL INVOICES/SRA - Mark Kelly

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Metals M8	Suite B13: OCP/PCB	Moisture Set	Cation Exchange Capacity	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254												X			
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X									
Perth Laboratory - NATA Site # 23736															
Mayfield Laboratory - NATA Site # 25079															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	BH1 0.3-0.4	Aug 31, 2021		Soil	S21-Se02136					X	X		X		
2	BH1 0.5-0.6	Aug 31, 2021		Soil	S21-Se02137				X		X				
3	BH2 0.3-0.4	Aug 31, 2021		Soil	S21-Se02138					X	X		X		
4	BH3 0.2-0.3	Aug 31, 2021		Soil	S21-Se02139						X		X		
5	BH3 0.6-0.7	Aug 31, 2021		Soil	S21-Se02140	X		X	X		X	X			
6	BH4 0.2-0.4	Aug 31, 2021		Soil	S21-Se02141					X	X		X		
7	BH4 0.9-1.0	Aug 31, 2021		Soil	S21-Se02142				X		X				
8	BH5 0.2-0.5	Aug 31, 2021		Soil	S21-Se02143					X	X		X		
9	BH5 0.4-0.5	Aug 31, 2021		Soil	S21-Se02144				X		X				

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Due: Sep 8, 2021
Priority: 5 Day
Contact Name: - ALL INVOICES/SRA - Mark Kelly

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Metals M8	Suite B13: OCP/PCB	Moisture Set	Cation Exchange Capacity	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254												X			
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X									
Perth Laboratory - NATA Site # 23736															
Mayfield Laboratory - NATA Site # 25079															
External Laboratory															
10	BH6 0.2-0.6	Aug 31, 2021		Soil	S21-Se02145					X	X		X		
11	BH7 0.3-0.4	Aug 31, 2021		Soil	S21-Se02146					X	X		X		
12	BH7 0.8-0.9	Aug 31, 2021		Soil	S21-Se02147				X		X				
13	BH8 0.0-0.1	Aug 31, 2021		Soil	S21-Se02148					X	X		X		
14	BH8 0.3-0.4	Aug 31, 2021		Soil	S21-Se02149				X		X				
15	BH9 0.2-0.3	Aug 31, 2021		Soil	S21-Se02150						X		X		
16	BH10 0.3-0.4	Aug 31, 2021		Soil	S21-Se02151					X	X		X		
17	BH10 0.4-0.5	Aug 31, 2021		Soil	S21-Se02152				X		X				
18	BH11 0.2-0.3	Aug 31, 2021		Soil	S21-Se02153						X		X		
19	BH12 0.3-0.4	Aug 31, 2021		Soil	S21-Se02154						X		X		
20	BH12 0.5-0.6	Aug 31, 2021		Soil	S21-Se02155	X		X	X		X	X			

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Eurofins Analytical Services Manager : Asim Khan

Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Metals M8	Suite B13: OCP/PCB	Moisture Set	Cation Exchange Capacity	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254												X			
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X									
Perth Laboratory - NATA Site # 23736															
Mayfield Laboratory - NATA Site # 25079															
External Laboratory															
21	BH13 0.2-0.3	Aug 31, 2021		Soil	S21-Se02156					X	X		X		
22	BH13 0.5-0.6	Aug 31, 2021		Soil	S21-Se02157				X		X				
23	BH14 0.2-0.3	Aug 31, 2021		Soil	S21-Se02158					X	X		X		
24	BH14 0.9-1.0	Aug 31, 2021		Soil	S21-Se02159				X		X				
25	BH15 0.1-0.2	Aug 31, 2021		Soil	S21-Se02160						X		X		
26	BH15 0.6-0.7	Aug 31, 2021		Soil	S21-Se02161				X		X				
27	BH16 0.2-0.3	Aug 31, 2021		Soil	S21-Se02162						X		X		
28	BH16 0.5-0.6	Aug 31, 2021		Soil	S21-Se02163				X		X				
29	BH17 0.1-0.2	Aug 31, 2021		Soil	S21-Se02164						X		X		
30	BH17 0.9-1.0	Aug 31, 2021		Soil	S21-Se02165				X		X				
31	BH18 0.1-0.2	Aug 31, 2021		Soil	S21-Se02166						X		X		

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Eurofins Analytical Services Manager : Asim Khan

Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Metals M8	Suite B13: OCP/PCB	Moisture Set	Cation Exchange Capacity	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254												X			
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X									
Perth Laboratory - NATA Site # 23736															
Mayfield Laboratory - NATA Site # 25079															
External Laboratory															
32	BH18 0.8-0.9	Aug 31, 2021		Soil	S21-Se02167				X		X				
33	BH19 0.1-0.2	Aug 31, 2021		Soil	S21-Se02168						X		X		
34	BH19 0.6-0.7	Aug 31, 2021		Soil	S21-Se02169	X		X	X		X	X			
35	BH20 0.2-0.3	Aug 31, 2021		Soil	S21-Se02170						X		X		
36	BH20 0.5-0.6	Aug 31, 2021		Soil	S21-Se02171				X		X				
37	BH21 0.0-0.1	Aug 31, 2021		Soil	S21-Se02172						X		X		
38	BH22 0.1-0.2	Aug 31, 2021		Soil	S21-Se02173						X		X		
39	BH22 0.6-0.7	Aug 31, 2021		Soil	S21-Se02174				X		X				
40	BH23 0.1-0.2	Aug 31, 2021		Soil	S21-Se02175						X		X		
41	D1	Aug 31, 2021		Soil	S21-Se02176					X	X		X		
42	D2	Aug 31, 2021		Soil	S21-Se02177					X	X		X		

eurofins | Environment Testing

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Received: Sep 1, 2021 7:23 PM
Due: Sep 8, 2021
Priority: 5 Day
Contact Name: - ALL INVOICES/SRA - Mark Kelly

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Metals M8	Suite B13: OCP/PCB	Moisture Set	Cation Exchange Capacity	Eurofins Suite B7	BTEXN and Volatile TRH	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254												X			
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X									
Perth Laboratory - NATA Site # 23736															
Mayfield Laboratory - NATA Site # 25079															
External Laboratory															
43	TRIP SPIKE	Aug 31, 2021		Soil	S21-Se02178										X
44	TRIP BLANK	Aug 31, 2021		Soil	S21-Se02180									X	
45	RINSATE	Aug 31, 2021		Water	S21-Se02181								X		
46	BH2 0.5-0.6	Aug 31, 2021		Soil	S21-Se02182		X								
47	BH6 0.5-0.6	Aug 31, 2021		Soil	S21-Se02183		X								
48	BH9 0.5-0.6	Aug 31, 2021		Soil	S21-Se02184		X								
49	BH11 0.4-0.5	Aug 31, 2021		Soil	S21-Se02185		X								
50	BH21 0.4-0.5	Aug 31, 2021		Soil	S21-Se02186		X								
51	BH23 0.6-0.7	Aug 31, 2021		Soil	S21-Se02187		X								
Test Counts						3	6	3	17	12	42	3	26	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							
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	
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							
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							
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-HCH	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-HCH	mg/kg	< 0.05			0.05	Pass	
d-HCH	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	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-HCH (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	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	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	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	< 10			10	Pass	
Method Blank							
Cation Exchange Capacity							
Cation Exchange Capacity	meq/100g	< 0.05			0.05	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	97			70-130	Pass	
TRH C10-C14	%	113			70-130	Pass	
Naphthalene	%	106			70-130	Pass	
TRH C6-C10	%	97			70-130	Pass	
TRH >C10-C16	%	109			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	96			70-130	Pass	
Toluene	%	100			70-130	Pass	
Ethylbenzene	%	101			70-130	Pass	
m&p-Xylenes	%	104			70-130	Pass	
o-Xylene	%	105			70-130	Pass	
Xylenes - Total*	%	104			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	112			70-130	Pass	
Acenaphthylene	%	104			70-130	Pass	
Anthracene	%	110			70-130	Pass	
Benz(a)anthracene	%	108			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(a)pyrene	%	110			70-130	Pass	
Benzo(b&j)fluoranthene	%	119			70-130	Pass	
Benzo(g.h.i)perylene	%	111			70-130	Pass	
Benzo(k)fluoranthene	%	118			70-130	Pass	
Chrysene	%	121			70-130	Pass	
Dibenz(a.h)anthracene	%	104			70-130	Pass	
Fluoranthene	%	109			70-130	Pass	
Fluorene	%	118			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	102			70-130	Pass	
Naphthalene	%	110			70-130	Pass	
Phenanthrene	%	113			70-130	Pass	
Pyrene	%	111			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	85			70-130	Pass	
4.4'-DDD	%	70			70-130	Pass	
4.4'-DDE	%	90			70-130	Pass	
4.4'-DDT	%	100			70-130	Pass	
a-HCH	%	81			70-130	Pass	
Aldrin	%	86			70-130	Pass	
b-HCH	%	81			70-130	Pass	
d-HCH	%	80			70-130	Pass	
Dieldrin	%	73			70-130	Pass	
Endosulfan I	%	76			70-130	Pass	
Endosulfan II	%	84			70-130	Pass	
Endosulfan sulphate	%	70			70-130	Pass	
Endrin	%	74			70-130	Pass	
Endrin aldehyde	%	78			70-130	Pass	
Endrin ketone	%	71			70-130	Pass	
g-HCH (Lindane)	%	89			70-130	Pass	
Heptachlor	%	71			70-130	Pass	
Heptachlor epoxide	%	79			70-130	Pass	
Hexachlorobenzene	%	93			70-130	Pass	
Methoxychlor	%	81			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1016	%	79			70-130	Pass	
Aroclor-1260	%	87			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	81			80-120	Pass	
Cadmium	%	98			80-120	Pass	
Chromium	%	97			80-120	Pass	
Copper	%	93			80-120	Pass	
Lead	%	101			80-120	Pass	
Mercury	%	103			80-120	Pass	
Nickel	%	94			80-120	Pass	
Zinc	%	90			80-120	Pass	
LCS - % Recovery							
% Clay	%	108			70-130	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	%	92			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S21-Se02137	CP	%	79			75-125	Pass	
Cadmium	S21-Se02137	CP	%	98			75-125	Pass	
Chromium	S21-Se02137	CP	%	99			75-125	Pass	
Copper	S21-Se02137	CP	%	100			75-125	Pass	
Lead	S21-Se02137	CP	%	108			75-125	Pass	
Mercury	S21-Se02137	CP	%	106			75-125	Pass	
Nickel	S21-Se02137	CP	%	96			75-125	Pass	
Zinc	S21-Se02137	CP	%	104			75-125	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH >C10-C16	S21-Se02138	CP	%	127			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	S21-Se02154	CP	%	81			70-130	Pass	
TRH C10-C14	S21-Se02154	CP	%	95			70-130	Pass	
Naphthalene	S21-Se02154	CP	%	92			70-130	Pass	
TRH C6-C10	S21-Se02154	CP	%	82			70-130	Pass	
TRH >C10-C16	S21-Se02154	CP	%	96			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S21-Se02154	CP	%	79			70-130	Pass	
Toluene	S21-Se02154	CP	%	87			70-130	Pass	
Ethylbenzene	S21-Se02154	CP	%	90			70-130	Pass	
m&p-Xylenes	S21-Se02154	CP	%	92			70-130	Pass	
o-Xylene	S21-Se02154	CP	%	93			70-130	Pass	
Xylenes - Total*	S21-Se02154	CP	%	92			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S21-Se02157	CP	%	75			75-125	Pass	
Cadmium	S21-Se02157	CP	%	92			75-125	Pass	
Chromium	S21-Se02157	CP	%	82			75-125	Pass	
Copper	S21-Se02157	CP	%	77			75-125	Pass	
Lead	S21-Se02157	CP	%	98			75-125	Pass	
Mercury	S21-Se02157	CP	%	94			75-125	Pass	
Nickel	S21-Se02157	CP	%	78			75-125	Pass	
Zinc	S21-Se02157	CP	%	79			75-125	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S21-Se05384	NCP	%	90			70-130	Pass	
Acenaphthylene	S21-Se05384	NCP	%	91			70-130	Pass	
Anthracene	S21-Se05384	NCP	%	90			70-130	Pass	
Benz(a)anthracene	S21-Se05384	NCP	%	99			70-130	Pass	
Benzo(a)pyrene	S21-Se05384	NCP	%	88			70-130	Pass	
Benzo(b&j)fluoranthene	S21-Se05384	NCP	%	97			70-130	Pass	
Benzo(g.h.i)perylene	S21-Se05384	NCP	%	83			70-130	Pass	
Benzo(k)fluoranthene	S21-Se05384	NCP	%	70			70-130	Pass	
Chrysene	S21-Se05384	NCP	%	83			70-130	Pass	
Dibenz(a.h)anthracene	S21-Se05384	NCP	%	105			70-130	Pass	
Fluoranthene	S21-Se05384	NCP	%	83			70-130	Pass	
Fluorene	S21-Se05384	NCP	%	95			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S21-Se05384	NCP	%	107			70-130	Pass	
Naphthalene	S21-Se05384	NCP	%	92			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Phenanthrene	S21-Se05384	NCP	%	88			70-130	Pass	
Pyrene	S21-Se05384	NCP	%	85			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C10-C14	S21-Se02173	CP	%	85			70-130	Pass	
TRH >C10-C16	S21-Se02173	CP	%	97			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	S21-Se02136	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S21-Se02136	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S21-Se02136	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S21-Se02136	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Naphthalene	S21-Se02136	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S21-Se02136	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S21-Se02136	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S21-Se02136	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S21-Se02136	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S21-Se02136	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S21-Se02136	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S21-Se02136	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S21-Se02136	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S21-Se02136	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S21-Se02136	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S21-Se02136	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S21-Se02136	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S21-Se02136	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S21-Se02136	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S21-Se02136	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S21-Se02136	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S21-Se02136	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S21-Se02136	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S21-Se02136	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S21-Se02136	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S21-Se02136	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S21-Se02136	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S21-Se02136	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S21-Se02136	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S21-Se02136	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S21-Se02136	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S21-Se02136	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S21-Se02136	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S21-Se02136	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S21-Se02136	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-HCH	S21-Se02136	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S21-Se02136	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	S21-Se02136	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	S21-Se02136	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Dieldrin	S21-Se02136	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S21-Se02136	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S21-Se02136	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S21-Se02136	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S21-Se02136	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S21-Se02136	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S21-Se02136	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-HCH (Lindane)	S21-Se02136	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S21-Se02136	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S21-Se02136	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S21-Se02136	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S21-Se02136	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	S21-Se02136	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S21-Se02136	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	S21-Se02136	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S21-Se02136	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	S21-Se02136	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	S21-Se02136	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	S21-Se02136	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	S21-Se02136	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	S21-Se02136	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S21-Se02136	CP	mg/kg	6.2	5.9	6.0	30%	Pass	
Cadmium	S21-Se02136	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S21-Se02136	CP	mg/kg	24	21	12	30%	Pass	
Copper	S21-Se02136	CP	mg/kg	27	29	4.0	30%	Pass	
Lead	S21-Se02136	CP	mg/kg	19	20	6.0	30%	Pass	
Mercury	S21-Se02136	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Zinc	S21-Se02136	CP	mg/kg	45	44	3.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S21-Se02136	CP	%	21	22	6.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	S21-Se02140	CP	uS/cm	65	69	5.7	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	S21-Se00966	NCP	pH Units	10	9.6	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S21-Se02146	CP	mg/kg	2.1	2.8	31	30%	Fail	Q15
Cadmium	S21-Se02146	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S21-Se02146	CP	mg/kg	29	38	26	30%	Pass	
Copper	S21-Se02146	CP	mg/kg	26	24	10	30%	Pass	
Lead	S21-Se02146	CP	mg/kg	19	19	1.0	30%	Pass	
Mercury	S21-Se02146	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S21-Se02146	CP	mg/kg	37	40	6.0	30%	Pass	
Zinc	S21-Se02146	CP	mg/kg	55	79	37	30%	Fail	Q15
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S21-Se02146	CP	%	10	13	23	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C10-C14	S21-Se02153	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S21-Se02153	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S21-Se02153	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C10-C16	S21-Se02153	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S21-Se02153	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S21-Se02153	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S21-Se02156	CP	mg/kg	2.5	3.4	30	30%	Pass	
Cadmium	S21-Se02156	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S21-Se02156	CP	mg/kg	17	26	40	30%	Fail	Q15
Copper	S21-Se02156	CP	mg/kg	26	33	25	30%	Pass	
Lead	S21-Se02156	CP	mg/kg	78	87	12	30%	Pass	
Mercury	S21-Se02156	CP	mg/kg	0.1	0.1	13	30%	Pass	
Nickel	S21-Se02156	CP	mg/kg	24	34	37	30%	Fail	Q15
Zinc	S21-Se02156	CP	mg/kg	76	87	13	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S21-Se02156	CP	%	13	13	6.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S21-Se02166	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	S21-Se02166	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S21-Se02166	CP	mg/kg	6.1	8.9	38	30%	Fail	Q15
Lead	S21-Se02166	CP	mg/kg	16	20	20	30%	Pass	
Mercury	S21-Se02166	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S21-Se02166	CP	mg/kg	< 5	9.1	72	30%	Fail	Q15
Zinc	S21-Se02166	CP	mg/kg	36	43	18	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S21-Se02166	CP	%	5.1	6.8	28	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S21-Se02176	CP	%	12	9.6	21	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
G01	The LORs have been raised due to matrix interference
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:

Asim Khan	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Charl Du Preez	Senior Analyst-Inorganic (NSW)
John Nguyen	Senior Analyst-Metal (NSW)
Roopesh Rangarajan	Senior Analyst-Volatile (NSW)
Emily Rosenberg	Senior Analyst-Metal (VIC)
Jonathon Angell	Senior Analyst-Inorganic (QLD)

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.

AARGUS PTY LTD

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Lidcombe, NSW 2141

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Email invoices: anika@aargus.net; cynthia@aargus.net; gokul@aargus.net; mark.kelly@aargus.net; sara@aargus.net

Laboratory Test Request / Chain of Custody Record

TO: MGT EUROFINS
UNIT F3, BUILDING F
16 MARS ROAD
LANE COVE WEST NSW 2066

PH: 028215 6222 FAX: 02 9420 2977
ATTN:

Sampling Date:	31.08.2021	**Job No:**	ES8338
Sampled By:	SBS	**Project:**	DSI
Project Manager:	MK	**Location:**	GREENACRE

Results required by: WEDNESDAY, 8TH SEPTEMBER 2021

Sampling details			Sample type														
Location	Depth (m)	Date	Soil	Water (Filled Up)	Air	Metals (As, Cd, Cr, Cu, Hg, Pb, Ni, Zn)	TPH	BTEXN	PAH	OCP	PCB			pH, CEC &%Clay		Analysis Suite(s)	KEEP SAMPLE?
BH1	0.3-0.4	31.08.2021	DSG			✓	✓	✓	✓	✓	✓					B7, B13	YES
BH1	0.5-0.6	31.08.2021	DSG			✓										M8	YES
BH2	0.3-0.4	31.08.2021	DSG			✓	✓	✓	✓	✓	✓					B7, B13	YES
BH2	0.5-0.6	31.08.2021	DSG														YES
BH3	0.2-0.3	31.08.2021	DSG			✓	✓	✓	✓							B7	YES
BH3	0.6-0.7	31.08.2021	DSG			✓								✓		M8	YES
BH4	0.2-0.4	31.08.2021	DSG			✓	✓	✓	✓	✓	✓					B7, B13	YES
BH4	0.9-1	31.08.2021	DSG			✓										M8	YES
BH5	0.2-0.5	31.08.2021	DSG			✓	✓	✓	✓	✓	✓					B7, B13	YES
BH5	0.4-0.5	31.08.2021	DSG			✓										M8	YES
BH6	0.2-0.6	31.08.2021	DSG			✓	✓	✓	✓	✓	✓					B7, B13	YES
BH6	0.5-0.6	31.08.2021	DSG														YES
BH7	0.3-0.4	31.08.2021	DSG			✓	✓	✓	✓	✓	✓					B7, B13	YES
BH7	0.8-0.9	31.08.2021	DSG			✓										M8	YES
BH8	0-0.1	31.08.2021	DSG			✓	✓	✓	✓	✓	✓					B7, B13	YES
BH8	0.3-0.4	31.08.2021	DSG			✓										M8	YES
BH9	0.2-0.3	31.08.2021	DSG			✓	✓	✓	✓							B7	YES
BH9	0.5-0.6	31.08.2021	DSG														YES
BH10	0.3-0.4	31.08.2021	DSG			✓	✓	✓	✓	✓	✓					B7, B13	YES
BH10	0.4-0.5	31.08.2021	DSG			✓										M8	YES
BH11	0.2-0.3	31.08.2021	DSG			✓	✓	✓	✓							B7	YES
BH11	0.4-0.5	31.08.2021	DSG														YES
BH12	0.3-0.4	31.08.2021	DSG			✓	✓	✓	✓							B7	YES
BH12	0.5-0.6	31.08.2021	DSG			✓								✓		M8	YES
BH13	0.2-0.3	31.08.2021	DSG			✓	✓	✓	✓	✓	✓					B7, B13	YES
BH13	0.5-0.6	31.08.2021	DSG			✓										M8	YES

Relinquished by			Received by		
Name	Signature	Date	Name	Signature	Date
Saad	SBS	01.09.2021			1/9

Legend:

WG	Water sample, glass bottle	USG	Undisturbed soil sample (glass j	DSP	Disturbed soil sample (small plastic bag)
WP	Water sample, plastic bottle	DSG	Disturbed soil sample (glass jar)	✓	Test required
GV	Glass vial	OTH	Other	ACAN	Air sample, canister

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#821278

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Laboratory Test Request / Chain of Custody Record

TO: MGT EUROFINS
UNIT F3, BUILDING F
16 MARS ROAD
LANE COVE WEST NSW 2066

PH: 028215 6222 FAX: 02 9420 2977
ATTN:

Sampling Date:	31.08.2021	Job No:	ES8338
Sampled By:	SBS	Project:	DSI
Project Manager:	MK	Location:	GREENACRE

Results required by: WEDNESDAY, 8TH SEPTEMBER 2021

Sampling details			Sample type														
Location	Depth (m)	Date	Soil	Water (Filled Up)	Air	Metals (As, Cd, Cr, Cu, Hg, Pb, Ni, Zn)	TPH	BTEXN	PAH	OCP	PCB			pH, CEC &%Clay		Analysis Suite(s)	KEEP SAMPLE?
BH14	0.2-0.3	31.08.2021	DSG			✓	✓	✓	✓	✓	✓					B7, B13	YES
BH14	0.9-1	31.08.2021	DSG			✓										M8	YES
BH15	0.1-0.2	31.08.2021	DSG			✓	✓	✓	✓							B7	YES
BH15	0.6-0.7	31.08.2021	DSG			✓										M8	YES
BH16	0.2-0.3	31.08.2021	DSG			✓	✓	✓	✓							B7	YES
BH16	0.5-0.6	31.08.2021	DSG			✓										M8	YES
BH17	0.1-0.2	31.08.2021	DSG			✓	✓	✓	✓							B7	YES
BH17	0.9-1	31.08.2021	DSG			✓										M8	YES
BH18	0.1-0.2	31.08.2021	DSG			✓	✓	✓	✓							B7	YES
BH18	0.8-0.9	31.08.2021	DSG			✓										M8	YES
BH19	0.1-0.2	31.08.2021	DSG			✓	✓	✓	✓							B7	YES
BH19	0.6-0.7	31.08.2021	DSG			✓								✓		M8	YES
BH20	0.2-0.3	31.08.2021	DSG			✓	✓	✓	✓							B7	YES
BH20	0.5-0.6	31.08.2021	DSG			✓										M8	YES
BH21	0-0.1	31.08.2021	DSG			✓	✓	✓	✓							B7	YES
BH21	0.4-0.5	31.08.2021	DSG														YES
BH22	0.1-0.2	31.08.2021	DSG			✓	✓	✓	✓							B7	YES
BH22	0.6-0.7	31.08.2021	DSG			✓										M8	YES
BH23	0.1-0.2	31.08.2021	DSG			✓	✓	✓	✓							B7	YES
BH23	0.6-0.7	31.08.2021	DSG														YES
D1	-	31.08.2021	DSG			✓	✓	✓	✓	✓	✓					B7, B13	YES
D2		31.08.2021	DSG			✓	✓	✓	✓	✓	✓					B7, B13	YES
TripSpike		04.08.2021		Vial													YES
TripBlank		04.08.2021		Vial			Please test for TRH F1 and BTEX										YES
Rinsates		04.08.2021		Vial		✓	✓	✓	✓							B7	YES

Relinquished by			Received by		
Name	Signature	Date	Name	Signature	Date
Saad	SBS	01.09.2021	Gurvir		1/9

Legend:

WG	Water sample, glass bottle	USG	Undisturbed soil sample (glass j	DSP	Disturbed soil sample (small plastic bag)
WP	Water sample, plastic bottle	DSG	Disturbed soil sample (glass jar)	✓	Test required
GV	Glass vial	OTH	Other	ACAN	Air sample, canister

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#821278

APPENDIX O

SUMMARY OF RESULTS

TABLE 2
SCHEDULE OF LABORATORY TESTING

Analyte / Analyte Group Sample	Depth (m)	TYPE	SAMPLING DATE	DUPLICATE	SPLIT	MET-8	TRH	BTEXN	PAH TRACE
Groundwater									
GW1	-	GW	02.09.2021	GWD1	GWSS1	✔	✔	✔	✔
GW2	-	GW	02.09.2021			✔	✔	✔	✔
GW5	-	GW	02.09.2021			✔	✔	✔	✔

Notes
MET-8: arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc
PAH: Polycyclic Aromatic Hydrocarbons
TPH: Total Petroleum Hydrcarbons
BTEX: Benzene, Toluene, Ethyl Benzene, Xylene
GW: Groundwater

TABLE E

HEAVY METALS TEST RESULTS

Analyte / Sample Location		HEAVY METALS (µg/L)							
		ARSENIC (As) - Total	CADMIUM (Cd)	CHROMIUM (Cr) - Total	COPPER (Cu)	LEAD (Pb)	MERCURY (Hg) - Total	NICKEL (Ni)	ZINC (Zn)
GW1	-	1	0.3	< 1	2	< 1	< 0.1	6	< 5
GW2	-	110	< 0.2	< 1	< 1	< 1	< 0.1	25	< 5
GW5	-	5	0.5	< 1	1	< 1	< 0.1	11	< 5
DUPLICATE GWD1	-	2	0.3	< 1	2	< 1	< 0.1	6	< 5
SPLIT GWSS1	-	2	0.1	3	< 1	< 1	< 0.1	6	< 5
Practical Quantitation Limits (PQL)		1	0.2	1	1	1	0.1	1	5
ANZECC & ARMCANZ [a] Guidelines for Fresh and Marine Water Quality (2000)									
Aquatic Ecosystems (Trigger Values)									
Fresh Water		24[b]	0.2	NV [d]	1.4	3.4	0.06	11	8
		13[c]		1[e]					
Water for recreational purposes		50	5	50	1000	50	1	100	5000

Notes

a: Investigation levels apply to typical slightly-moderated disturbed systems.

b: as As (III)

c: as As (V)

d: as Cr (III)

e: as Cr (VI)

NV: No value derived

TABLE F
BTEX TEST RESULTS

Analyte / Sample Location		BTEX (µg/L)				
		BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES	STYRENE (Vinyl Benzene)
GW1	-	<1	<1	<1	<3	-
GW2	-	<1	<1	<1	<3	-
GW5	-	<1	<1	<1	<3	-
DUPLICATE GWD1	-	<1	<1	<1	<3	-
SPLIT GWSS1	-	<1	<2	<2	<2	
Practical Quantitation Limits (PQL)		1	1	1	3	-
ANZECC & ARMCANZ a Guidelines for Fresh and Marine Water Quality (2000)						
Aquatic Ecosystems (Trigger Values)						
Fresh water		950	NV	NV	350[b]	NV
					200[c]	
Water for recreational purposes		10				

Notes
a: Investigation levels apply to typical slightly-moderated disturbed systems.
b: as o-xylene
c: as p-xylene
NV: No value derived

TABLE G
TOTAL RECOVERABLE HYDROCARBONS (TRH), BTEX AND NAPHTHALENE TEST RESULTS FOR GROUNDWATER HSLs IN CLAY

Analyte / Sample Location	Depth (m)	TRH (mg/L) F1 [a]	TRH (mg/L) F2 [b]	BTEX (mg/L) BENZENE	BTEX (mg/L) TOLUENE	BTEX (mg/L) ETHYL BENZENE	BTEX (mg/L) TOTAL XYLENES	BTEX (mg/L) NAPHTHALENE
GW1	-	< 0.02	< 0.05	< 0.001	< 0.001	< 0.001	< 0.003	< 0.01
GW2	-	< 0.02	< 0.05	< 0.001	< 0.001	< 0.001	< 0.003	< 0.01
GW5	-	< 0.02	< 0.05	< 0.001	< 0.001	< 0.001	< 0.003	< 0.01
DUPLICATE GWD1	-	< 0.02	< 0.05	< 0.001	< 0.001	< 0.001	< 0.003	< 0.01
SPLIT GWSS1	-	< 0.02	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	<0.005
Practical Quantitation Limits (PQL)		0.02	0.05	0.001	0.001	0.001	0.003	0.01
NATIONAL ENVIRONMENT PROTECTION MEASURE (2013)								
Health Screening Levels (HSL) - Table 1A (4)								
HSL A & HSL B: Low-high density residential								
Source depth - 2m to <4m		NL	NL	5	NL	NL	NL	NL
Source depth - 4m to <8m		NL	NL	5	NL	NL	NL	NL
Source depth - 8m +		NL	NL	5	NL	NL	NL	NL
HSL C: recreational / open space								
Source depth - 2m to <4m		NL	NL	NL	NL	NL	NL	NL
Source depth - 4m to <8m		NL	NL	NL	NL	NL	NL	NL
Source depth - 8m +		NL	NL	NL	NL	NL	NL	NL
HSL D: Commercial / Industrial								
Source depth - 2m to <4m		NL	NL	30	NL	NL	NL	NL
Source depth - 4m to <8m		NL	NL	30	NL	NL	NL	NL
Source depth - 8m +		NL	NL	35	NL	NL	NL	NL

Notes
a: To obtain F1 subtract the sum of BTEX concentrations from the C_6-C_{10} fraction.
b: To obtain F2 subtract naphthalene from the >C_{10}-C_{16} fraction.
NL: Not Limiting

TABLE H
PAH TEST RESULTS

Analyte / Sample Location		PAH (µg/L)				
		NAPHTHALENE	ANTHRACENE	PHENANTHRACENE	FLUORANTHENE	BENZO(a)PYRENE
GW1	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
GW2	-	0.05	< 0.01	0.14	< 0.01	< 0.01
GW5	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
DUPLICATE GWD1	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
SPLIT GWSS1	-	0.04	<0.02	0.06	<0.02	<0.005
Practical Quantitation Limits (PQL)		0.01	0.01	0.01	0.01	0.01
NEPM 2013 Table 1C - Groundwater Investigation Levels (GILs)						
Aquatic Ecosystems						
Fresh		16	NV	NV	NV	NV
ANZECC 2000 Low Reliability Trigger Values						
Freshwater		-	0.01	0.6	1	0.1
Guidelines for Managing Risk in Recreatinoal Waters (2008)						
Water for recreational purpose		NV	NV	NV	NV	0.1

Notes NV: No Value derived

TABLE 1
SCHEDULE OF LABORATORY TESTING

Analyte / Analyte Group Sample	Depth (m)	SAMPLING DATE	DUPLICATE	SPLIT	MET-8	TPH	BTEX	PAH	OC	PCB	ASBESTOS	pH, CEC, %CLAY
BH1	0.3-0.4	31.08.2021			✓	✓	✓	✓	✓	✓	✔	
BH1	0.5-0.6	31.08.2021			✓							
BH2	0.3-0.4	31.08.2021			✓	✓	✓	✓	✓	✓	✔	
BH2	0.5-0.6	31.08.2021										
BH3	0.2-0.3	31.08.2021			✓	✓	✓	✓			✔	
BH3	0.6-0.7	31.08.2021			✓							✔
BH4	0.2-0.4	31.08.2021	D2	SS2	✓	✓	✓	✓	✓	✓	✔	
BH4	0.9-1	31.08.2021			✓							
BH5	0.2-0.5	31.08.2021			✓	✓	✓	✓	✓	✓	✔	
BH5	0.4-0.5	31.08.2021			✓							
BH6	0.2-0.6	31.08.2021			✓	✓	✓	✓	✓	✓	✔	
BH6	0.5-0.6	31.08.2021										
BH7	0.3-0.4	31.08.2021	D1	SS1	✓	✓	✓	✓	✓	✓	✔	
BH7	0.8-0.9	31.08.2021			✓							
BH8	0-0.1	31.08.2021			✓	✓	✓	✓	✓	✓	✔	
BH8	0.3-0.4	31.08.2021			✓							
BH9	0.2-0.3	31.08.2021			✓	✓	✓	✓			✔	
BH9	0.5-0.6	31.08.2021										
BH10	0.3-0.4	31.08.2021			✓	✓	✓	✓	✓	✓	✔	
BH10	0.4-0.5	31.08.2021			✓							
BH11	0.2-0.3	31.08.2021			✓	✓	✓	✓			✔	
BH11	0.4-0.5	31.08.2021										
BH12	0.3-0.4	31.08.2021			✓	✓	✓	✓			✔	
BH12	0.5-0.6	31.08.2021			✓							✔
BH13	0.2-0.3	31.08.2021			✓	✓	✓	✓	✓	✓	✔	
BH13	0.5-0.6	31.08.2021			✓							
BH14	0.2-0.3	31.08.2021			✓	✓	✓	✓	✓	✓	✔	
BH14	0.9-1	31.08.2021			✓							
BH15	0.1-0.2	31.08.2021			✓	✓	✓	✓			✔	
BH15	0.6-0.7	31.08.2021			✓							
BH16	0.2-0.3	31.08.2021			✓	✓	✓	✓			✔	
BH16	0.5-0.6	31.08.2021			✓							
BH17	0.1-0.2	31.08.2021			✓	✓	✓	✓			✔	
BH17	0.9-1	31.08.2021			✓							
BH18	0.1-0.2	31.08.2021			✓	✓	✓	✓			✔	
BH18	0.8-0.9	31.08.2021			✓							
BH19	0.1-0.2	31.08.2021			✓	✓	✓	✓			✔	
BH19	0.6-0.7	31.08.2021			✓							✔
BH20	0.2-0.3	31.08.2021			✓	✓	✓	✓			✔	
BH20	0.5-0.6	31.08.2021			✓							
BH21	0-0.1	31.08.2021			✓	✓	✓	✓			✔	
BH21	0.4-0.5	31.08.2021										
BH22	0.1-0.2	31.08.2021			✓	✓	✓	✓			✔	
BH22	0.6-0.7	31.08.2021			✓							
BH23	0.1-0.2	31.08.2021			✓	✓	✓	✓			✔	
BH23	0.6-0.7	31.08.2021										

TABLE A1

HEAVY METALS TEST RESULTS FOR HILs & EILs

Sample Location	Depth (m)	ARSENIC	CADMIUM	CHROMIUM	COPPER	LEAD g	MERCURY	NICKEL	ZINC
	Analyte	HEAVY METALS (mg/kg)							
BH1	0.3-0.4	6.2	< 0.4	24	27	19	< 0.1	13	45
BH1	0.5-0.6	4.7	< 0.4	10	33	18	< 0.1	10	68
BH2	0.3-0.4	3	< 0.4	23	25	13	< 0.1	23	40
BH3	0.2-0.3	< 2	< 0.4	7.3	15	130	< 0.1	6.5	72
BH3	0.6-0.7	3.9	< 0.4	11	23	24	< 0.1	6	48
BH4	0.2-0.4	6.4	< 0.4	24	25	53	< 0.1	18	110
BH4	0.9-1	6.6	< 0.4	19	27	13	< 0.1	12	57
BH5	0.2-0.5	76	< 0.4	35	18	320	< 0.1	12	56
BH5	0.4-0.5	11	< 0.4	21	25	15	< 0.1	6.2	38
BH6	0.2-0.6	5.2	< 0.4	22	18	18	0.2	11	41
BH7	0.3-0.4	2.1	< 0.4	29	26	19	< 0.1	37	55
BH7	0.8-0.9	2.9	< 0.4	7.7	20	17	< 0.1	8.2	72
BH8	0-0.1	< 2	< 0.4	180	43	20	< 0.1	7.5	270
BH8	0.3-0.4	4.5	< 0.4	16	32	18	< 0.1	< 5	31
BH9	0.2-0.3	4.4	< 0.4	17	18	23	< 0.1	8.5	98
BH10	0.3-0.4	4	< 0.4	63	34	12	< 0.1	58	98
BH10	0.4-0.5	4.7	< 0.4	16	19	24	< 0.1	5.5	30
BH11	0.2-0.3	8.5	< 0.4	22	19	24	< 0.1	7.9	42
BH12	0.3-0.4	4.7	< 0.4	44	25	12	< 0.1	37	64
BH12	0.5-0.6	8	< 0.4	20	23	12	< 0.1	9.1	52
BH13	0.2-0.3	2.5	< 0.4	17	26	78	0.1	24	76
BH13	0.5-0.6	6.3	< 0.4	24	22	16	< 0.1	7.9	47
BH14	0.2-0.3	3.3	< 0.4	13	18	17	< 0.1	12	60
BH14	0.9-1	7.5	< 0.4	25	22	17	< 0.1	7.9	49
BH15	0.1-0.2	2.8	< 0.4	12	20	45	< 0.1	14	88
BH15	0.6-0.7	3.8	< 0.4	11	12	26	< 0.1	5.9	40
BH16	0.2-0.3	3.7	< 0.4	18	16	24	< 0.1	13	49
BH16	0.5-0.6	4.9	< 0.4	17	17	13	< 0.1	7.6	37
BH17	0.1-0.2	3.6	< 0.4	6.7	9.5	26	< 0.1	5.6	36
BH17	0.9-1	7	< 0.4	15	21	15	< 0.1	6	31
BH18	0.1-0.2	< 2	< 0.4	6.1	13	16	< 0.1	< 5	36
BH18	0.8-0.9	6.6	< 0.4	18	21	20	< 0.1	9.7	43
BH19	0.1-0.2	4	< 0.4	12	23	84	< 0.1	11	130
BH19	0.6-0.7	3.9	< 0.4	15	32	84	< 0.1	11	220
BH20	0.2-0.3	3.7	< 0.4	13	21	16	< 0.1	< 5	26
BH20	0.5-0.6	9.9	< 0.4	29	19	19	< 0.1	6.3	31
BH21	0-0.1	4.8	< 0.4	11	25	25	< 0.1	12	74
BH22	0.1-0.2	2.7	< 0.4	13	17	14	< 0.1	13	43
BH22	0.6-0.7	7.5	< 0.4	7.8	19	13	< 0.1	< 5	17
BH23	0.1-0.2	6.7	< 0.4	11	39	90	< 0.1	20	170
DUPLICATE D1	-	4.1	< 0.4	32	39	17	< 0.1	53	63
DUPLICATE D2	-	6.6	< 0.4	33	33	28	< 0.1	27	81
SPLIT SS1	-	<5	<1	18	18	20	< 0.1	22	23
SPLIT SS2	-	<5	<1	60	51	11	< 0.1	58	61
Practical Quantitation Limits (PQL)		2	0.4	5	5	5	0.1	5	5
NATIONAL ENVIRONMENT PROTECTION MEASURE (2013)									
Health Investigation Levels (HIL) - Table 1A (1)									
HIL A [a]		100	20	100	6000	300	40[e] / 10[f]	400	7400
HIL B [b]		500	150	500	30,000	1,200	120[e] / 30[f]	1200	60,000
HIL C [c]		300	90	300	17,000	600	80[e] / 13[f]	1200	30,000
HIL D [d]		3000	900	3600	240,000	1,500	730[e] / 180[f]	6000	400,000
Ecological Investigation Levels (EIL) - Table 1B (5)									
Areas of ecological significance		40[h]							
Urban residential and public open space [i]		100[h]							
Commercial and industrial		160[h]							

Notes

a: Residential with garden/accessible soil (home grown poduce <10% fruit and vegetable intake (no poultry), also includes childcare centres, preschools and primary schools.

b: Residential with minimal opportunities for soil access; includes dwellings with fully and permanently paved yard space such as high rise buildings and apartments.

c: Public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. This does not include undeveloped public open space where the potential for exposure is lower and where a site-specific assessment may be more appropriate

d: Commercial/industrial, includes premises such as shops, offices, factories and industrial sites

e: 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,

f: Methyl mercury: assessment of methyl mercury should only occur where there is evidence of its potential source. It may be associated with inorganic mercury and anaerobic microorganism activity in aquatic environments. In addition the reliability and quality of sampling/analysis should be considered.

g: Lead: HIL is based on blood lead models (IEUBK for HILs A, B and C and adult lead model for HIL D where 50% oral bioavailability has been considered. Site-specific bioavailability may be important and should be considered where appropriate.

h: Aged values are applicable to arsenic contamination present in soil for at least two years. For fresh contamination refer to Schedule B5c.

i: Urban residential / public open space is broadly equivalent to the HIL-A, HIL-B and HIL-C land use scenarios in Table 1A(1) Footnote 1 and as described in Schedule B7.

TABLE A2

CATION EXCHANGE CAPACITY (CEC), % CLAY & pH TEST RESULTS FOR THE SOIL PROPERTIES FOR EILs

Analyte / Sample Location	Depth (m)	CEC (cmol/kg)	% CLAY (%)	pH (pH units)
BH3	0.6-0.7	17	27	5.7
BH12	0.5-0.6	14	32	6.5
BH19	0.6-0.7	18	19	7.1

TABLE A3
SITE DERIVED EILs

Analyte / Sample Location	Depth (m)	HEAVY METALS (mg/kg) COPPER	LEAD	NICKEL	ZINC
Added Contaminant Limit (ACL) [a]					
BH3	0.6-0.7	130	1100	270	270
BH12	0.5-0.6	190	1100	170	400
BH19	0.6-0.7	210	1100	270	700
Ambient Background Concentration (ABC)					
BH3	0.6-0.7	23	24	6	48
BH12	0.5-0.6	23	12	9.1	52
BH19	0.6-0.7	32	84	11	220
Calculated EIL (ABC + ACL)					
BH3	0.6-0.7	153	1124	276	318
BH12	0.5-0.6	213	1112	179.1	452
BH19	0.6-0.7	243	1184	281	920
FINAL SITE EIL AFTER ROUNDING [b]					
BH3	0.6-0.7	150	1100	280	320
BH12	0.5-0.6	210	1100	180	450
BH19	0.6-0.7	240	1100	280	920

Notes a: The ACL for Cu may be determined by pH or CEC and the lower of the determined values should be selected for EIL calculation.

b: The following rounding rules are applicable to the EILs:

<1	to nearest 0.1
1 - <10	to nearest interger
10 - <100	to nearest 5
100 - <1000	to nearest 10
>1000	to nearest 100

TABLE A4
METAL TEST RESULTS FOR EILs

Sample Location	Depth (m)	HEAVY METALS (mg/kg) COPPER	LEAD	NICKEL	ZINC
BH1	0.3-0.4	27	19	13	45
BH1	0.5-0.6	33	18	10	68
BH2	0.3-0.4	25	13	23	40
BH3	0.2-0.3	15	130	6.5	72
BH3	0.6-0.7	23	24	6	48
BH4	0.2-0.4	25	53	18	110
BH4	0.9-1	27	13	12	57
BH5	0.2-0.5	18	320	12	56
BH5	0.4-0.5	25	15	6.2	38
BH6	0.2-0.6	18	18	11	41
BH7	0.3-0.4	26	19	37	55
BH7	0.8-0.9	20	17	8.2	72
BH8	0-0.1	43	20	7.5	270
BH8	0.3-0.4	32	18	< 5	31
BH9	0.2-0.3	18	23	8.5	98
BH10	0.3-0.4	34	12	58	98
BH10	0.4-0.5	19	24	5.5	30
BH11	0.2-0.3	19	24	7.9	42
BH12	0.3-0.4	25	12	37	64
BH12	0.5-0.6	23	12	9.1	52
BH13	0.2-0.3	26	78	24	76
BH13	0.5-0.6	22	16	7.9	47
BH14	0.2-0.3	18	17	12	60
BH14	0.9-1	22	17	7.9	49
BH15	0.1-0.2	20	45	14	88
BH15	0.6-0.7	12	26	5.9	40
BH16	0.2-0.3	16	24	13	49
BH16	0.5-0.6	17	13	7.6	37
BH17	0.1-0.2	9.5	26	5.6	36
BH17	0.9-1	21	15	6	31
BH18	0.1-0.2	13	16	< 5	36
BH18	0.8-0.9	21	20	9.7	43
BH19	0.1-0.2	23	84	11	130
BH19	0.6-0.7	32	84	11	220
BH20	0.2-0.3	21	16	< 5	26
BH20	0.5-0.6	19	19	6.3	31
BH21	0-0.1	25	25	12	74
BH22	0.1-0.2	17	14	13	43
BH22	0.6-0.7	19	13	< 5	17
BH23	0.1-0.2	39	90	20	170
DUPLICATE D1	-	39	17	53	63
DUPLICATE D2	-	33	28	27	81
SPLIT SS1	-	18	20	22	23
SPLIT SS2	-	51	11	58	61
Practical Quantitation Limits (PQL)		5	5	5	5
Site Derived Ecological Investigation Levels (EIL)		150	1100	180	320

Notes a: none

TABLE B1
TOTAL RECOVERABLE HYDROCARBONS (TRH), BTEX AND NAPHTHALENE TEST RESULTS FOR HSLs IN CLAY

Analyte / Sample Location	Depth (m)	TRH (mg/kg) F1 [a]	TRH (mg/kg) F2 [b]	BTEX (mg/kg) BENZENE	BTEX (mg/kg) TOLUENE	BTEX (mg/kg) ETHYL BENZENE	BTEX (mg/kg) TOTAL XYLENES	NAPHTHALENE
BH1	0.3-0.4	< 20	< 50	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH2	0.3-0.4	< 20	< 250	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH3	0.2-0.3	< 20	< 250	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH4	0.2-0.4	< 20	< 50	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH5	0.2-0.5	< 20	< 50	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH6	0.2-0.6	< 20	< 50	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH7	0.3-0.4	< 20	< 250	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH8	0-0.1	< 20	< 250	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH9	0.2-0.3	< 20	< 50	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH10	0.3-0.4	< 20	< 50	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH11	0.2-0.3	< 20	< 50	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH12	0.3-0.4	< 20	< 50	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH13	0.2-0.3	< 20	< 250	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH14	0.2-0.3	< 20	< 50	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH15	0.1-0.2	< 20	< 50	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH16	0.2-0.3	< 20	< 50	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH17	0.1-0.2	< 20	< 50	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH18	0.1-0.2	< 20	< 50	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH19	0.1-0.2	< 20	< 50	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH20	0.2-0.3	< 20	< 50	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH21	0-0.1	< 20	< 50	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH22	0.1-0.2	< 20	< 50	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH23	0.1-0.2	< 20	< 250	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
DUPLICATE D1	-	< 20	< 250	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
DUPLICATE D2	-	< 20	< 50	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
SPLIT SS1	-	< 10	< 50	< 0.2	< 0.2	< 0.2	< 0.5	< 1
SPLIT SS2	-	< 10	< 50	< 0.2	< 0.2	< 0.2	< 0.5	< 1
Practical Quantitation Limits (PQL)		20	50	0.1	0.1	0.1	0.3	0.5
NATIONAL ENVIRONMENT PROTECTION MEASURE (2013)								
Health Screening Levels (HSL) - Table 1A (3)								
HSL A & HSL B: Low-high density residential								
Source depth - 0m to <1m		50	280	0.7	480	NL	110	5
Source depth - 1m to <2m		90	NL	1	NL	NL	310	NL
Source depth - 2m to <4m		150	NL	2	NL	NL	NL	NL
Source depth - 4m +		290	NL	3	NL	NL	NL	NL
HSL C: recreational / open space								
Source depth - 0m to <1m		NL	NL	NL	NL	NL	NL	NL
Source depth - 1m to <2m		NL	NL	NL	NL	NL	NL	NL
Source depth - 2m to <4m		NL	NL	NL	NL	NL	NL	NL
Source depth - 4m +		NL	NL	NL	NL	NL	NL	NL
HSL D: Commercial / Industrial								
Source depth - 0m to <1m		310	NL	4	NL	NL	NL	NL
Source depth - 1m to <2m		480	NL	6	NL	NL	NL	NL
Source depth - 2m to <4m		NL	NL	9	NL	NL	NL	NL
Source depth - 4m +		NL	NL	20	NL	NL	NL	NL

Notes
a: To obtain F1 subtract the sum of BTEX concentrations from the C_6-C_{10} fraction.
b: To obtain F2 subtract naphthalene from the >C_{10}-C_{16} fraction.
NL: Not Limiting

TABLE B2
TOTAL RECOVERABLE HYDROCARBONS (TRH), BTEX AND BENZO(a)PYRENE TEST RESULTS
ESLs FOR FINE GRAINED SOIL TEXTURE

Analyte / Sample Location	Depth (m)	TRH (mg/kg)				BTEX (mg/kg)				PAH (mg/kg)
		F1 (C_6-C_{10}) [a]	F2 (>C_{10}-C_{16}) [b]	F3 (C_{16}-C_{34})	F4 (C_{34}-C_{40})	BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES	BENZO(a)PYRENE
BH1	0.3-0.4	< 20	< 50	< 100	< 100	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH2	0.3-0.4	< 20	< 250	< 500	< 500	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH3	0.2-0.3	< 20	< 250	< 500	< 500	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH4	0.2-0.4	< 20	< 50	100	< 100	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH5	0.2-0.5	< 20	< 50	120	< 100	< 0.1	< 0.1	< 0.1	< 0.3	0.8
BH6	0.2-0.6	< 20	< 50	< 100	< 100	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH7	0.3-0.4	< 20	< 250	< 500	< 500	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH8	0-0.1	< 20	< 250	< 500	< 500	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH9	0.2-0.3	< 20	< 50	< 100	< 100	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH10	0.3-0.4	< 20	< 50	< 100	< 100	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH11	0.2-0.3	< 20	< 50	< 100	< 100	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH12	0.3-0.4	< 20	< 50	< 100	< 100	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH13	0.2-0.3	< 20	< 250	< 500	< 500	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH14	0.2-0.3	< 20	< 50	280	< 100	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH15	0.1-0.2	< 20	< 50	< 100	< 100	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH16	0.2-0.3	< 20	< 50	150	< 100	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH17	0.1-0.2	< 20	< 50	< 100	< 100	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH18	0.1-0.2	< 20	< 50	130	< 100	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH19	0.1-0.2	< 20	< 50	110	< 100	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH20	0.2-0.3	< 20	< 50	< 100	< 100	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH21	0-0.1	< 20	< 50	< 100	< 100	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH22	0.1-0.2	< 20	< 50	< 100	< 100	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
BH23	0.1-0.2	< 20	< 250	620	< 500	< 0.1	< 0.1	< 0.1	< 0.3	0.8
DUPLICATE D1	-	< 20	< 250	< 500	< 500	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
DUPLICATE D2	-	< 20	< 50	< 100	< 100	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5
SPLIT SS1	-	< 10	< 50	120	120	< 0.2	< 0.2	< 0.2	< 0.5	< 0.5
SPLIT SS2	-	< 10	< 50	140	170	< 0.2	< 0.2	< 0.2	< 0.5	< 0.5
Practical Quantitation Limits (PQL)		20	50	100	100	0.1	0.1	0.1	0.3	0.5
NATIONAL ENVIRONMENT PROTECTION MEASURE (2013)										
Ecological Screening Levels (ESL) - Table 1B (6)										
Areas of ecological significance		125*	25*	-	-	10	65	40	1.6	0.7
Urban residential and public open space		180*	120*	1300	5600	65	105	125	45	0.7
Commercial and industrial		215*	170*	2500	6600	95	135	185	95	1.4

Notes
a: To obtain F1 subtract the sum of BTEX concentrations from the C_6-C_{10} fraction.
b: To obtain F2 subtract naphthalene from the >C_{10}-C_{16} fraction.
*: ESLs are of low reliability except where indicated by * which indicates that the ESL is of moderate reliability.
"-": "-" indicates that insufficient data was available to derive a value.

TABLE B3
TOTAL RECOVERABLE HYDROCARBONS (TRH) TEST RESULTS
MANAGEMENT LIMITS FOR FINE GRAINED SOIL TEXTURE

Analyte / Sample Location	Depth (m)	TRH (mg/kg) F1 (C_6-C_{10}) [a]	F2 (>C_{10}-C_{16}) [a]	F3 (C_{16}-C_{34})	F4 (C_{34}-C_{40})
BH1	0.3-0.4	< 20	< 50	< 100	< 100
BH2	0.3-0.4	< 20	< 250	< 500	< 500
BH3	0.2-0.3	< 20	< 250	< 500	< 500
BH4	0.2-0.4	< 20	< 50	100	< 100
BH5	0.2-0.5	< 20	< 50	120	< 100
BH6	0.2-0.6	< 20	< 50	< 100	< 100
BH7	0.3-0.4	< 20	< 250	< 500	< 500
BH8	0-0.1	< 20	< 250	< 500	< 500
BH9	0.2-0.3	< 20	< 50	< 100	< 100
BH10	0.3-0.4	< 20	< 50	< 100	< 100
BH11	0.2-0.3	< 20	< 50	< 100	< 100
BH12	0.3-0.4	< 20	< 50	< 100	< 100
BH13	0.2-0.3	< 20	< 250	< 500	< 500
BH14	0.2-0.3	< 20	< 50	280	< 100
BH15	0.1-0.2	< 20	< 50	< 100	< 100
BH16	0.2-0.3	< 20	< 50	150	< 100
BH17	0.1-0.2	< 20	< 50	< 100	< 100
BH18	0.1-0.2	< 20	< 50	130	< 100
BH19	0.1-0.2	< 20	< 50	110	< 100
BH20	0.2-0.3	< 20	< 50	< 100	< 100
BH21	0-0.1	< 20	< 50	< 100	< 100
BH22	0.1-0.2	< 20	< 50	< 100	< 100
BH23	0.1-0.2	< 20	< 250	620	< 500
DUPLICATE D1	-	< 20	< 250	< 500	< 500
DUPLICATE D2	-	< 20	< 50	< 100	< 100
SPLIT SS1	-	< 10	< 50	120	120
SPLIT SS2	-	< 10	< 50	140	170
Practical Quantitation Limits (PQL)		20	50	100	100
NATIONAL ENVIRONMENT PROTECTION MEASURE (2013)					
Management Limits - Table 1B (7)					
Residential parkland and public open space		800	1000	3500	10,000
Commercial and industrial		800	1000	5000	10,000

Notes
a: Separate management limits for BTEX and naphthalene are not available hence these should not be subtracted from the relevant fractions to obtain F1 and F2.

b: Management limits are applied after consideration of relevant ESLs and HSLs.

TABLE C

POLYCYCLIC AROMATIC HYDROCARBONS (PAH) TEST RESULTS FOR HILs, EILs & ESLs

Analyte / Sample Location	Depth (m)	PAH (mg/kg) Carcinogenic PAHs (as BaP TEQ) [e]	TOTAL PAHs [f]	BENZO(a)PYRENE	NAPHTHALENE
BH1	0.3-0.4	0.6	< 0.5	< 0.5	<0.5
BH2	0.3-0.4	0.6	< 0.5	< 0.5	<0.5
BH3	0.2-0.3	0.6	< 0.5	< 0.5	<0.5
BH4	0.2-0.4	0.6	< 0.5	< 0.5	<0.5
BH5	0.2-0.5	1.3	7.3	0.8	<0.5
BH6	0.2-0.6	0.6	< 0.5	< 0.5	<0.5
BH7	0.3-0.4	0.6	< 0.5	< 0.5	<0.5
BH8	0-0.1	0.6	< 0.5	< 0.5	<0.5
BH9	0.2-0.3	0.6	< 0.5	< 0.5	<0.5
BH10	0.3-0.4	0.6	< 0.5	< 0.5	<0.5
BH11	0.2-0.3	0.6	< 0.5	< 0.5	<0.5
BH12	0.3-0.4	0.6	< 0.5	< 0.5	<0.5
BH13	0.2-0.3	0.6	< 0.5	< 0.5	<0.5
BH14	0.2-0.3	0.6	< 0.5	< 0.5	<0.5
BH15	0.1-0.2	0.6	< 0.5	< 0.5	<0.5
BH16	0.2-0.3	0.6	< 0.5	< 0.5	<0.5
BH17	0.1-0.2	0.6	< 0.5	< 0.5	<0.5
BH18	0.1-0.2	0.6	< 0.5	< 0.5	<0.5
BH19	0.1-0.2	0.6	1.5	< 0.5	<0.5
BH20	0.2-0.3	0.6	< 0.5	< 0.5	<0.5
BH21	0-0.1	0.6	< 0.5	< 0.5	<0.5
BH22	0.1-0.2	0.6	< 0.5	< 0.5	<0.5
BH23	0.1-0.2	1.3	5.9	0.8	<0.5
DUPLICATE D1	-	0.6	< 0.5	< 0.5	<0.5
DUPLICATE D2	-	0.6	< 0.5	< 0.5	<0.5
SPLIT SS1	-	0.6	< 0.5	< 0.5	<0.5
SPLIT SS2	-	0.6	< 0.5	< 0.5	<0.5
Practical Quantitation Limits (PQL)		0.5	0.5	0.5	0.5
NATIONAL ENVIRONMENT PROTECTION MEASURE (2013)					
Health Investigation Levels (HIL) - Table 1A (1)					
HIL A [a]		3	300		
HIL B [b]		4	400		
HIL C [c]		3	300		
HIL D [d]		40	4000		
Ecological Investigation Levels (EIL) - Table 1B (5)					
Areas of ecological significance					10 [g]
Urban residential and public open space [h]					170 [g]
Commercial and industrial					370 [g]
Ecological Screening Levels (ESL) - Table 1B (6)					
Areas of ecological significance				0.7 [i]	
Urban residential and public open space				0.7 [i]	
Commercial and industrial				1.4 [i]	

Notes

a: Residential with garden/accessible soil (home grown poduce <10% fruit and vegetable intake (no poultry), also includes childcare centres, preschools and primary schools.

b: Residential with minimal opportunities for soil access; includes dwellings with fully and permanently paved yard space such as high rise buildings and apartments.

c: Public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. This does not include undeveloped public open space where the potential for exposure is lower and where a site-specific assessment may be more appropriate.

d: Commercial/industrial, includes premises such as shops, offices, factories and industrial sites.

e: Carcinogenic PAHs: HIL is based on the 8 carcinogenic PAHs and their TEFs (potency relative to B(a)P) adopted by CCME 2008 (refer Schedule B7). The B(a)P TEQ is calculated by multiplying the concentration of each carcinogenic PAH in the sample by its B(a)P TEF, given below, and summing these products.

PAH species	TEF	PAH species	TEF
Benzo(a)anthracene	0.1	Benzo(g,h,i)perylene	0.01
Benzo(a)pyrene	1	Chrysene	0.01
Benzo(b+j)fluoranthene	0.1	Dibenz(a,h)anthracene	1
Benzo(k)fluoranthene	0.1	Indeno(1,2,3-c,d)pyrene	0.1

Where the B(a)P occurs in bitumen fragments it is relatively immobile and does not represent a significant health risk.

f: Total PAHs: HIL is based on the sum of the 16 PAHs most commonly reported for contaminated sites (WHO 1998). The application of the total PAH HIL should consider the presence of carcinogenic PAHs and naphthalene (the most volatile PAH). Carcinogenic PAHs reported in the total PAHs should meet the B(a)P TEQ HIL. Naphthalene reported in the total PAHs should meet the relevant HSL.

g: Insufficient data was available to calculate aged values for DDT and naphthalene, consequently the values for fresh contamination should be used.

h: Urban residential / public open space is broadly equivalent to the HIL-A, HIL-B and HIL-C land use scenarios in Table 1A(1) Footnote 1 and as described in Schedule B7.

i: For coarse and fine grained texture soils.

TABLE D

ORGANOCHLORINE PESTICIDES (OCP) AND POLYCHLORINATED BIPHENYLS (PCB) TEST RESULTS FOR HILs & EISLs

Analyte / Sample Location	Depth (m)	Organochlorine Pesticides (mg/kg)								
		DDT + DDE + DDD	ALDRIN & DIELDRIN	CHLORDANE	ENDOSULFAN	ENDRIN	HEPTACHLOR	HCB	METHOXYCHLOR	PCB [g]
BH1	0.3-0.4	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1
BH2	0.3-0.4	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1
BH4	0.2-0.4	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1
BH5	0.2-0.5	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1
BH6	0.2-0.6	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1
BH7	0.3-0.4	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1
BH8	0-0.1	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1
BH10	0.3-0.4	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1
BH13	0.2-0.3	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1
BH14	0.2-0.3	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1
DUPLICATE D1	-	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1
DUPLICATE D2	-	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1
SPLIT SS1	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.2	< 0.1
SPLIT SS2	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.2	< 0.1
Practical Quantitation Limits (PQL)		0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.1
NATIONAL ENVIRONMENT PROTECTION MEASURE (2013)										
Health Investigation Levels (HIL) - Table 1A (1)										
HIL A [a]		240	6	50	270	10	6	10	300	1
HIL B [b]		600	10	90	400	20	10	15	500	1
HIL C [c]		400	10	70	340	20	10	10	400	1
HIL D [d]		3600	45	530	2000	100	50	80	2500	7
Ecological Investigation Levels (EIL) - Table 1B (5)										
Areas of ecological significance		3 [e, h]								
Urban residential and public open space [f]		180 [e, h]								
Commercial and industrial		640 [e, h]								

Notes

a: Residential with garden/accessible soil (home grown poduce <10% fruit and vegetable intake (no poultry), also includes childcare centres, preschools and primary schools.

b: Residential with minimal opportunities for soil access; includes dwellings with fully and permanently paved yard space such as high rise buildings and apartments.

c: Public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. This does not include undeveloped public open space where the potential for exposure is lower and where a site-specific assessment may be more appropriate

d: Commercial/industrial, includes premises such as shops, offices, factories and industrial sites

e: Insufficient data was available to calculate aged values for DDT and naphthalene, consequently the values for fresh contamination should be used.

f: Urban residential / public open space is broadly equivalent to the HIL-A, HIL-B and HIL-C land use scenarios in Table 1A(1) Footnote 1 and as described in Schedule B7.

g: PCBs: HIL relates to non-dioxin-like PCBs only. Where a PCB source is known, or suspected, to be present at a site, a site-specific assessment of exposure to all PCBs (including dioxin-like PCBs) should be undertaken.

h: For DDT only.

TABLE E
ASBESTOS TEST RESULTS

Analyte / Sample Location	Depth (m)	Field Observations* Visible ACM detected (>7mm)	Material Sampled for Analysis	Laboratory Results Asbestos Present / Absent	Type of Asbestos Present	Laboratory Results Asbestos %w/w
BH1	0.3-0.4	No visible ACM observed	Soil	No Asbestos detected	-	<0.001
BH2	0.3-0.4	No visible ACM observed	Soil	No Asbestos detected	-	<0.001
BH3	0.2-0.3	No visible ACM observed	Soil	No Asbestos detected	-	<0.001
BH4	0.2-0.4	No visible ACM observed	Soil	No Asbestos detected	-	<0.001
BH5	0.2-0.5	No visible ACM observed	Soil	No Asbestos detected	-	<0.001
BH6	0.2-0.6	No visible ACM observed	Soil	No Asbestos detected	-	<0.001
BH7	0.3-0.4	No visible ACM observed	Soil	No Asbestos detected	-	<0.001
BH8	0-0.1	No visible ACM observed	Soil	No Asbestos detected	-	<0.001
BH9	0.2-0.3	No visible ACM observed	Soil	No Asbestos detected	-	<0.001
BH10	0.3-0.4	No visible ACM observed	Soil	No Asbestos detected	-	<0.001
BH11	0.2-0.3	No visible ACM observed	Soil	No Asbestos detected	-	<0.001
BH12	0.3-0.4	No visible ACM observed	Soil	No Asbestos detected	-	<0.001
BH13	0.2-0.3	No visible ACM observed	Soil	No Asbestos detected	-	<0.001
BH14	0.2-0.3	No visible ACM observed	Soil	No Asbestos detected	-	<0.001
BH15	0.1-0.2	No visible ACM observed	Soil	No Asbestos detected	-	<0.001
BH16	0.2-0.3	No visible ACM observed	Soil	No Asbestos detected	-	<0.001
BH17	0.1-0.2	No visible ACM observed	Soil	No Asbestos detected	-	<0.001
BH18	0.1-0.2	No visible ACM observed	Soil	No Asbestos detected	-	<0.001
BH19	0.1-0.2	No visible ACM observed	Soil	No Asbestos detected	-	<0.001
BH20	0.2-0.3	No visible ACM observed	Soil	No Asbestos detected	-	<0.001
BH21	0-0.1	No visible ACM observed	Soil	No Asbestos detected	-	<0.001
BH22	0.1-0.2	No visible ACM observed	Soil	No Asbestos detected	-	<0.001
BH23	0.1-0.2	No visible ACM observed	Soil	No Asbestos detected	-	<0.001
DUPLICATE D1		No visible ACM observed	Soil	No Asbestos detected	-	<0.001
DUPLICATE D2		No visible ACM observed	Soil	No Asbestos detected	-	<0.001
SPLIT SS1		No visible ACM observed	Soil	No Asbestos detected	-	<0.001
SPLIT SS2		No visible ACM observed	Soil	No Asbestos detected	-	<0.001
WA Guidelines for the Assessment, Remediation and Management of Asbestos - Contaminated Sites in Western Australia - May 2009						
National Environment Protection (Assessment of Site Contamination) Measure 2013 Schedule B1						
%w/w asbestos for FA and AF						0.001%
%w/w asbestos for ACM - Residential use, childcare centres, preschools etc.						0.01%
%w/w asbestos for ACM - Residential, minimal soil access (fully sealed surfaces)						0.04%
%w/w asbestos for ACM - Parks, public open spaces, playing fields etc.						0.02%
%w/w asbestos for ACM - Commercial / Industrial						0.05%
All forms of Asbestos						No visible asbestos for surface soils

Note:
ACM = Asbestos Containing Materials >7mm x 7mm (visible by eye)
FA = Friable and Fibrous Asbestos Materials >7mm x 7mm and <7mm x 7mm
AF = Asbestos Fines <7mm x 7mm ACM including free fibres (visible by microscope only)
* Field Observations: All ACM observed are assumed to contain Asbestos until otherwise tested and recorded as such.
NT = Not Tested

APPENDIX P

IMPORTANT INFORMATION ABOUT YOUR ENVIRONMENTAL REPORT

Aargus

IMPORTANT INFORMATION ABOUT YOUR ENVIRONMENTAL SITE ASSESSMENT

These notes have been prepared by Aargus (Australia) Pty Ltd and its associated companies using guidelines prepared by ASFE (The Association) of Engineering Firms Practising in the Geo-sciences. They are offered to help you in the interpretation of your Environmental Site Assessment (ESA) reports.

REASONS FOR CONDUCTING AN ESA

ESA's are typically, though not exclusively, carried out in the following circumstances:

- as pre-acquisition assessments, on behalf of either purchaser or vender, when a property is to be sold;
- as pre-development assessments, when a property or area of land is to be redeveloped or have its use changed for example, from a factory to a residential subdivision;
- as pre-development assessments of greenfield sites, to establish "baseline" conditions and assess environmental, geological and hydrological constraints to the development of, for example, a landfill; and
- as audits of the environmental effects of an ongoing operation.

Each of these circumstances requires a specific approach to the assessment of soil and groundwater contamination. In all cases however, the objective is to identify and if possible quantify the risks that unrecognised **c**ontamination poses to the proposed activity. Such risks may be both financial, for example, cleanup costs or limitations on site use, and physical, for example, health risks to site users or the public.

THE LIMITATIONS OF AN ESA

Although the information provided by an ESA could reduce exposure to such risks, no ESA, however, diligently carried out can eliminate them. Even a rigorous professional assessment may fail to detect all contamination on a site. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas which showed no signs of contamination when sampled.

AN ESA REPORT IS BASED ON A UNIQUE SET OF PROJECT SPECIFIC FACTORS

Your environmental report should not be used:

- when the nature of the proposed development is changed, for example, if a residential development is proposed instead of a commercial one;
- when the size or configuration of the proposed development is altered;
- when the location or orientation of the proposed structure is modified;
- when there is a change of ownership
- or for application to an adjacent site.

To help avoid costly problems, refer to your consultant to determine how any factors, which have changed subsequent to the date of the report, may affect its recommendations.

ESA "FINDINGS" ARE PROFESSIONAL ESTIMATES

Site assessment identifies actual subsurface conditions only at those points where samples are taken, when they are taken. Data derived through sampling and subsequent laboratory testing are interpreted by geologists, engineers or scientists who then render an opinion about overall subsurface conditions, the nature and extent of contamination, its likely impact on the proposed development and appropriate remediation measures. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than a report indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to help minimise its impact. For this reason owners should retain the services of their consultants

through the development stage, to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

SUBSURFACE CONDITIONS CAN CHANGE

Natural processes and the activity of man change subsurface conditions. As an ESA report is based on conditions, which existed at the time of subsurface exploration, decisions should not be based on an ESA report whose adequacy may have been affected by time. Speak with the consultant to learn if additional tests are advisable.

ESA SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND PERSONS

Every study and ESA report is prepared in response to a specific brief to meet the specific needs of specific individuals. A report prepared for a consulting civil engineer may not be adequate for a construction contractor, or even some other consulting civil engineer. Other persons should not use a report for any purpose, or by the client for a different purpose. No individual other than the client should apply a report even apparently for its intended purpose without first conferring with the consultant. No person should apply a report for any purpose other than that originally contemplated without first conferring with the consultant.

AN ESA REPORT IS SUBJECT TO MISINTERPRETATION

Costly problems can occur when design professionals develop their plans based on misinterpretations of an ESA. To help avoid these problems, the environmental consultant should be retained to work with appropriate design professionals to explain relevant findings and to review the adequacy of their plans and specifications relative to contamination issues.

LOGS SHOULD NOT BE SEPARATED FROM THE ENGINEERING REPORT

Final borehole or test pit logs are developed by environmental scientists, engineers or geologists based upon their interpretation of field logs (assembled by site personnel) and laboratory evaluation of field samples. Only final logs customarily included in our reports. These logs should not under any circumstances be redrawn for inclusion in site remediation or other design drawings, because drafters may commit errors or omissions in the transfer process. Although photographic reproduction eliminates this problem, it does nothing to minimise the possibility of contractors misinterpreting the logs during bid preparation. When this occurs, delays, disputes and unanticipated costs are the all-too-frequent result.

To reduce the likelihood of boring log misinterpretation, the complete report must be available to persons or organisations involved in the project, such as contractors, for their use. Those who o not provide such access may proceed under the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing all the available information to persons and organisations such as contractors helps prevent costly construction problems and the adversarial attitudes that may aggravate them to disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY

Because an ESA is based extensively on judgement and opinion, it is necessarily less exact than other disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, model clauses have been developed for use in transmittals. These are not exculpatory clauses designed to foist liabilities onto some other party. Rather, they are definitive clauses that identify where your consultant’s responsibilities begin and end. Their use helps all parties involved recognise their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your ESA report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.