

Preliminary contamination investigation

Proposed subdivision of *Golf Course Heights Estate* Euchareena Road, Molong NSW



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Summary report

Introduction

A residential subdivision is proposed for *Golf Course Heights Estate*, Lots 11 and 12 DP546140 Euchareena Road, Molong NSW. The proposed lots will range in size from 453m² to 2,372m². Historical land-use over the majority of the site is grazing on pasture and within remnant woodlands. A slaughterhouse operated in the south eastern section more than 60 years ago. An investigation of the site is required to determine the soil contamination status and suitability for rural-residential land-use.

Scope

The scope was to identify past potentially contaminating activities, identify potential types of contamination, discuss the site condition, provide a preliminary assessment of site contamination and assess the need for further investigation to determine suitability for residential land-use. The scope of works included site inspection, soil sampling and analysis of the soil samples for contaminants of concern.

Summary

An inspection of the site was made on 27 August and 27 September 2021. Land-use on the site is currently rural-residential. A dwelling is present in the central western section of the site. The dwelling is serviced by an on-site effluent system.

The site had a grazing land-use history. The use of agricultural pesticides over the area in the past is expected to be low. Vegetation cover within the investigation area was 100% with groundcover vegetation dominated by phalaris. Remnant eucalypt trees occur in the central and southern sections.

A small slaughterhouse historically operated from the south eastern section of the site. Slaughterhouse infrastructure has been removed. Levels of potential contaminants in samples collected from the former slaughterhouse location were less than adopted thresholds.

Two areas of stockpiles are present. Stockpile 1 is located in the south eastern section of the site and comprises material generated from site cleanup works including around the former slaughterhouse. Asbestos containing materials were identified in the stockpiles. Level of potential contaminants were below general solid waste thresholds. The material is classified as asbestos waste with a subclassification of general solid waste and requires removal and disposal to landfill.

Source of material within Stockpile 2 is not known. Characterisation of the material is required to determine suitability for remaining on-site or off-site re-use or disposal.

Trace inert debris were identified in the location of the former slaughterhouse, in the north western section and western section of the site. The debris is an amenity issue.

No evidence of mines, sheep dips or mixing sheds were identified on the site from the review of site history or site inspection.

The soil sampling program did not detect elevated levels of analysed metals across the general site. OCP were not detected in the samples collected across the general site. The levels of all other substances evaluated were below the adopted thresholds for residential land-use with access to soil.

Recommendations

The stockpiles south east of the former slaughterhouse require removal and disposal to landfill as asbestos waste with a sub-classification of general solid waste. A clearance certificate should be issued following removal works to confirm satisfactory removal of asbestos containing materials.

The stockpile in the eastern section of the site should be assessed based on end use. Material remaining on-site should be assessed for suitability for residential land-use. Material to be removed from site for re-use should be assessed in accordance with the NSW EPA ENM Exemption.

The on-site septic tank requires decommissioning in accordance with NSW Health Advisory Note 3. The absorption trench should be decommissioned by cultivation and incorporation of lime.

An unexpected finds procedure should be adopted for site development works.

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1. Introduction

A residential subdivision is proposed for *Golf Course Heights Estate*, Lots 11 and 12 DP546140 Euchareena Road, Molong NSW. The proposed lots will range in size from 453m² to 2,372m². Historical land-use over the majority of the site is grazing on pasture and within remnant woodlands. A slaughterhouse operated in the south eastern section more than 60 years ago. An investigation of the site is required to determine the soil contamination status and suitability for rural-residential land-use.

A desktop study and a review of the available history were undertaken on the site. A walkover and site inspection for evidence of contamination from past activities was conducted on 27 August and 27 September 2021.

2. Objectives

The objective of the investigation was to determine suitability of the site for the proposed residential land-use.

3. Scope of work

Envirowest Consulting Pty Ltd was commissioned by Wakefield Ashurst Developments Pty Ltd to undertake a contamination assessment, in accordance with the contaminated land management planning guidelines, from the *Contaminated Land Management Act 1997* and the *State Environmental Policy No. 55 (SEPP 55)*, of *Golf Course Heights Estate* Euchareena Road, Molong NSW. The objective was to identify past potentially contaminating activities, identify potential contamination types, discuss the site condition, provide a preliminary assessment of site contamination and assess the need for further investigation or suitability for rural-residential land-use.

4. Site identification

Address	168 Euchareena Road Molong NSW
Deposited plans	Lots 11 and 12 DP546140
Latitude and longitude	-33.09° 148.89°
Geographic coordinates	55H E676301m S6336973m
Client	Wakefield Ashurst Developments Pty Ltd
Owners	Wakefield Ashurst Developments Pty Ltd
Current occupiers	Wakefield Ashurst Developments Pty Ltd
Area	Approximately 41ha
Local government area	Cabonne Council
Current zoning	R5 – Large lot residential (Cabonne LEP 2012)
Trigger for investigation	Change in land-use
Locality map	Figure 1

5. Site history

5.1 Land-uses

The site is located in a rural area east of the village of Molong. The site is used for rural land-use. No stock were being grazed on the site at the time of site inspection. An occupied dwelling is located in the central western section.

5.2 Summary of council records

The site is mapped on the terrestrial biodiversity and groundwater vulnerability Cabonne LEP (2012) maps.

5.3 EPA contaminated sites list

The investigation area is not listed on the NSW EPA register of contaminated sites (13 October 2021) or sites notified to the EPA (11 October 2021).

5.4 Sources of information

Site inspection 27 August and 27 September 2021 by Envirowest Consulting Pty Ltd

NSW EPA records of public notices under the CLM Act 1997

Soil and geological maps

Spatial information exchange historic parish maps

Historical aerial photographs (1964, 1973, 1982, 1989, 1998, 2007, 2011 2020) including NSW Government historical imagery and Google Earth

Cabonne LEP 2012

5.5 Review of historic aerial photographs, maps and plans

5.5.1 Aerial photographs

Year of photograph	Visual observations on site
1964	The north eastern section of the site is cleared of trees and appears to be used for grazing. Remnant trees are present in the south western section. A dam is present in the south western corner. Structures are potentially present in the south eastern section. The photograph is not clear to sufficiently identify structure features.
1973	Two dams are located in the north eastern section of the site. The potential structures are still visible.
1982	There appears to be one structure in the south eastern section of the site in the location identified as an old cottage on the 2006 survey plan described in Section 5.5.2.
1989	A house has been constructed in the central section of the site. Two additional structures are visible in the south eastern section of the site. Reference to the 2006 survey plan indicates the structures to be sheds and yards. The structure identified as a cottage has been modified and appears to be smaller than in the 1982 aerial photograph. A tank is visible in the central eastern section of the site.
1993	The area around the cottage appears to be maintained with an access road from Back Saleyards Road to the cottage.
1998	The area around the cottage no longer appears maintained.
2007	Fences are present across the site. The shed identified south west of the cottage in the 2006 survey plan is identifiable. No other changes are evident on the site or in surrounding land.
2011	All structures except a tank in the south eastern section are no longer visible. A stockpile (Stockpile 1 in Figure 2) is present south of the former structure location. A stockpile (Stockpile 2 in Figure 2) is present in the eastern section of the site.
2020	Grazing is occurring on cleared grassland and woodlands. Additional material appears present in Stockpile 1.

5.5.2 Other

Review of the 1886 historical parish map indicated the site was owned by Mary Marsden and Mrs J Betts. The site formed part of a larger lot which extended to the east, south and west. The 1895, 1908, 1915 and 1938 parish maps indicate the site is owned by The Rev^d Fred Wilkinson and Richard Sadler (in trust). The 1895 map depicts proposed smaller lots across the site. The subdivision lines are no longer present on the 1908 map and the golf course area has been subdivided off. Proposed subdivision lines are present in the eastern section of the 1915 map and the golf course is noted to be a racecourse and showground. The proposed subdivision lines are not depicted on the 1938 map

The 1981 topographic map based on 1971 aerial photography and field revision in 1977 depicts the site as containing scattered timber. A track traverses the site and two buildings are present in the south eastern section.

Local residents report a small slaughterhouse operated from the south eastern section of the site. The slaughterhouse was operated by the local butcher. Date of operation is not known but it is not expected to have operated before the 1960's.

A survey plan prepared for the site by Craig Jaques & Associates (Orange) Pty Ltd dated 31 March 2006 identified the existing dwelling and four dams on the site. It also identified an old cottage, metal sheds, yards and tanks within the former slaughterhouse location.

5.6 Chronological list of site uses

The historical land-use of the site is grazing. Grazing is not expected to have occurred in recent times. A small slaughterhouse operated from the south eastern section in the early to mid 1900's. A cottage was also located in this area. The slaughterhouse and cottage infrastructure were removed in the 2010's. A dwelling was constructed on the site in the 1980's.

5.7 Buildings and infrastructure

Infrastructure on-site includes a residential dwelling with associated sheds. Two above ground concrete water tanks are present on the site. The south eastern tank is expected to have been used as part of the slaughterhouse operations. The slaughterhouse buildings have been removed, Various remnant building materials are present around the former slaughterhouse location. No fencing is located across the site.

5.8 Spills, losses or discharges

No records for spills or losses on the site were available. No records for discharges to land, water or air were available.

5.9 Relevant complaint history

None known

5.10 Previous investigations

None known

5.11 Historical neighbouring land-use

North – Euchareena Road, grazing

South – Grazing

East – Back Saleyards Road, grazing

West – Grazing

Historical neighbouring land-use is not expected to have impacted on the site.

5.12 Contaminant sources

The historic grazing land-use is likely to have resulted in application of pesticides in routine management. Fertilisers applied may contain heavy metal contaminants. No bio solids are known to have been applied to the site. Organochlorine pesticides may have been applied in the general management of pastures.

A range of potential contaminants may be associated with the slaughterhouse. Fuels and oils may have been stored on the site. Asbestos containing building materials may have been used in the construction.

5.13 Contaminants of concern

Based on historical activities and site inspection the contaminants of concern across the site are:

- Heavy metals (arsenic, cadmium, chromium, copper, nickel, lead and zinc)
- Organochlorine pesticides (OCP)

Based on historical activities and site inspection the contaminants of concern associated with the slaughterhouse are:

- Heavy metals (arsenic, cadmium, chromium, copper, nickel, lead, zinc, mercury)
- Total recoverable hydrocarbons (TRH C6-C40)
- Benzene, toluene, ethylbenzene, xylenes, naphthalene (BTEXN)
- Polycyclic aromatic hydrocarbons (PAH)
- Asbestos

5.14 Integrity assessment

The site history was obtained from a site inspection and history review. The information is consistent with the current site condition and to the best of the assessor's knowledge is accurate.

6. Site condition and surrounding environment

6.1 Site inspection

The site was inspected by an environmental scientist of Envirowest Consulting Pty Ltd on 27 August and 27 September 2021.

6.2 Land-use

Current land-use is vacant agricultural land. A dwelling is present in the central western section of the site.

6.3 Current neighbouring land-use

North – Euchareena Road, grazing

South – Grazing, rural-residential

East – Back Saleyards Road, grazing

West – Grazing

Present neighbouring land-use is not expected to be impacting on the site.

6.4 Surface cover and vegetation

Vegetation cover on the site was dominated by phalaris with trace broadleaved weeds including plantain. Ruderal weeds occur in previously disturbed areas in the former slaughterhouse location, stockpile 1 and stockpile 2. Remnant eucalypt trees are present in the central and southern sections of the site. Ornamental plant species are located around the dwelling. Vegetation cover across the site was 100%.

6.5 Evidence of visible contamination

Stockpiles are present in the southern and eastern sections of the site. The southern stockpiles (Stockpile 1 in Figure 2) comprise brown sandy clay with some concrete, tiles, cement sheeting, gravel, bricks and cobbles. A small area of ash was identified. Cement sheeting was also identified on the surface between stockpiles. The stockpiles are expected to be residual material from the removal of the slaughterhouse infrastructure.

The eastern stockpile (Stockpile 2 in Figure 2) comprises brown sandy clay. Source of the material is not known. The stockpile was vegetated with variegated thistle.

Trace household debris comprising plastic pots, cans, takeaway food wrappers and household items were identified in the former slaughterhouse location and adjacent a tree in the north western section. Concrete blocks were identified in the western section of the site. The foreign materials are considered inert and an amenity issue.

No signs of visible contamination such as discolouration or staining was identified on the surface of the site. No signs of settlement or subsidence was identified on the site.

6.6 Topography

The investigation area is located on a mid-slope with slope from 1 to 3%. A ridge traverses the site running west through to the centre of the site and orientated to the south in the eastern section of the site. Aspect is dependent on the ridge and ranges from northerly in the north eastern section to southerly in the southern section and easterly in the eastern section. Site elevation ranged from 566m AHD along the southern boundary to 583m AHD at the dwelling location.

6.7 Soils and geology

The study area is within the Molong Soil Landscape (Kovac *et al.* 1990). Dominant soils within the landscape are euzozems with non-calcareous brown soils and yellow podzolic soils on the lower slopes.

The site is underlain by Cargo Andesite (Kovac *et al.* 1990). Parent rock comprises andesite, tuff, slate and limestone. Parent material is *in situ* and alluvial-colluvial materials derived from parent rocks.

6.8 Water

6.8.1 Surface water

Surface run-off follows the topography of the site. Surface water over the majority of the site flows south into drainage lines which empty into Molong Creek located approximately 1km south of the site. Several small dams are located to capture surface water flows from the site. Surface water in the northern section flows into a drainage line which flows west into Molong Creek. Molong Creek is considered a highly disturbed ecosystem due to historical land clearing and surrounding agricultural land-use.

6.8.2 Groundwater

One groundwater bore was identified on the NSW Government Water NSW website as occurring on the site. The on-site bore is licensed for stock and domestic use and was drilled in 1993 to a depth of 41.1m. Water bearing zones were from 21.3m to 25.9m in limestone. Standing water level at the time of construction was 15.2m. One bore is located within 500m of the site. The bore is located on the adjacent golf club site approximately 30m from the northern boundary. The bore is currently licensed for stock and domestic use, was drilled in 1982 with a final depth of 32m. Water bearing zones were from 23 to 32m in basalt. Standing water level at the time of drilling was 23m. is located on-site.

6.9 Evidence of possible naturally occurring contaminants

No natural sources of PAH were identified.

The site is not mapped as an acid sulphate soil risk (NSW SEED Portal accessed 10 September 2021).

The site is mapped as a geological unit with low asbestos potential (NSW SEED Portal accessed 10 September 2021).

6.10 Environmentally sensitive features or habitats

The site contains a remnant eucalypt woodland. Molong Creek is located approximately 1km south of the site. Molong Creek is considered a highly disturbed ecosystem due to agriculture occurring within the catchment and clearing of native vegetation along the creek.

7. Conceptual site model

7.1 Contaminant sources

Potential exists for contaminating activities to have been undertaken on site which may impact on the suitability for the proposed land-use. The historic agricultural land-use may have resulted in application of pesticides and contaminating activities to the site.

The historic slaughterhouse may have resulted in storage of fuels for equipment and importation of fill for site works. Asbestos containing materials may have been used in the construction of the slaughterhouse.

7.2 Contaminants of concern

Based on historical activities and site inspection the contaminants of concern across the general site are:

- Heavy metals (arsenic, cadmium, chromium, copper, nickel, lead, zinc and mercury)
- Organochlorine pesticides (OCP)

Based on historical activities and site inspection the contaminants of concern associated with the slaughterhouse are:

- Heavy metals (arsenic, cadmium, chromium, copper, nickel, lead, zinc and mercury)
- Total recoverable hydrocarbons (TRH)
- Benzene, toluene, ethylbenzene, xylenes, naphthalene (BTEXN)
- Polycyclic aromatic hydrocarbons (PAH)
- Asbestos

7.3 Potential receptors

The proposed land-use of the site is residential. The site has historically been used for grazing and rural-residential land-use. A slaughterhouse was historically present in the south eastern section.

Human receptors include:

- Residents (adults and children)
- Visitors
- Construction workers
- Intrusive maintenance workers

Ecological receptors include

- Flora and fauna on the site and adjacent to the site
- Aquatic flora and fauna receptors on-site and off-site

7.4 Exposure pathways

Pathways for exposure to contaminants are:

- Dermal contact following soil disturbance
- Ingestion and inhalation after soil disturbance
- Surface water and sediment runoff into waterways
- Leaching of contaminants into the groundwater
- Direct contact of flora and fauna with the soil

7.5 Source receptor linkages

Potential source pathway receptor linkages are identified to enable evaluation of any adverse impact on human health or ecology.

The proposed land-use of the site is residential and human receptors to the investigation area are likely. Proposed users of the site may have a risk of exposure if contaminants are present and the soil is disturbed. Residents, visitors, construction workers and intrusive maintenance workers may potentially be receptors to soil contaminants through direct contact to soil which includes ingestion and dermal contact.

The contaminants of concern include volatiles and asbestos fibres. Inhalation of soil material is considered a pathway for exposure and may occur as a result of soil disturbance and dust production. Major soil disturbance before and after the development of the site is considered unlikely. Soil disturbance during construction and development of the site is expected to be accompanied by erosion control measures which will reduce the incidence of dust.

Vegetation on the site may be potential receptors to soil contamination through direct uptake of contaminants.

The source receptor linkage to aquatic organisms and ecosystems is considered incomplete as the site is well vegetated and movement of sediments from the site is unlikely. During construction work it is expected that erosion control measures will be implemented and movement of sediment off site will be unlikely. Following development of the site it is expected that vegetation will be re-established or hard surfaces constructed which will control sediment movement from the site.

Groundwater is not identified as a potential receptor to contamination. Groundwater in the locality is located at depths greater than 20m confined in limestone. Contaminants are expected to originate from the soil surface. Depth to groundwater and the presence of clay subsoils are expected to restrict downward movement of potential contaminants.

Source/contaminants	Transport	Potential exposure pathways	Receptors
☒ Use of pesticides (heavy metals and OCP) ☒ Storage of fuels (TRH, BTEXN, PAH) ☒ Importation of fill (metals, TRH, BTEXN, PAH) ☒ Building materials (asbestos)	☒ Wind ☐ Sedimentation ☐ Groundwater ☐ Surface water ☒ Volatilisation	☒ Direct contact (ingestion and absorption) (human and environment) ☒ Inhalation ☒ Runoff ☒ Leaching	☒ Residents (adults and children) ☒ Visitors (adults and children) ☒ Construction workers ☒ Intrusive maintenance workers ☒ Terrestrial flora and fauna ☐ Aquatic flora and fauna

☒ Potential, ☐ unknown/unlikely

8. Data quality objectives (DQO)

8.1 State the problem

The site is a proposed residential subdivision. The property has historically been used for grazing and rural-residential land-use which may have resulted in application of pesticides and contaminating activities. The south eastern section of the site historically operated as a small slaughterhouse. The site requires investigation to ensure suitability for the proposed land-use.

8.2 Identify the decision

The land-use proposed is residential and the levels of contaminants should be less than the thresholds listed in Section 10. The decision problem is, do the levels of potential contaminants exceed the assessment criteria listed in Section 10.

8.3 Identify the inputs decision

Investigations of the site is required to identify any potential contaminants from historical land-use.

8.4 Define the boundaries of the study

The investigation area is *Golf Course Heights Estate* Lots 11 and 12 DP546140, Euchareena Road, Molong NSW.

8.5 Develop a decision rule

The initial guidelines for soil were the health and ecological investigation levels for residential land-use (NEPC 1999).

If soil contamination was identified then the contaminant source and extent of contamination was determined.

8.6 Specify acceptable limits on the decision errors.

The 95% upper confidence limit of average levels of samples collected is less than the threshold levels and the results are less than 250% of relevant thresholds.

8.7 Optimize the design for obtaining data

Soil samples were collected from the general site on an approximate 100m grid pattern and combined to form composite samples. Discrete soil samples were also collected from the site. Systematic sampling was undertaken around the historic slaughterhouse.

9. Sampling analysis plan and sampling methodology

9.1 Sampling strategy

9.1.1 Sampling design

A systematic sampling pattern was adopted to assess the probable location of contamination. Uniform management practices are expected to have occurred across the site. The general site has been historically managed as part of a single unit and is expected to have been treated similarly.

A systematic sampling pattern was adopted to assess the location of the former slaughterhouse buildings.

A judgmental sampling was undertaken to assess stockpiles created as part of demolition of the slaughterhouse and clean-up of the general site. Stockpiles were sampled based on appearance with samples collected from the various types of material.

9.1.2 Sampling locations

Discrete soil samples were collected from the general site on an approximate 100m grid pattern. Four discrete samples were combined to form a composite soil sample. A total of 40 discrete soil samples were collected and combined to form 10 composite samples for analysis.

Ten discrete soil samples were collected from the former slaughterhouse location on an approximate grid pattern of 20m. Five discrete soil samples were collected from the stockpiles (Stockpile 1) created during demolition of the slaughterhouse and clean-up of the general site.

The sampling locations are described in Figure 2.

9.1.3 Sampling density

The sampling density across the general site can detect a potential hot spot across the site with a radius of 59m at a 95% level of confidence.

The sampling frequency is less than the minimum recommended by NEPM (1999) but expected to be sufficient due to the historic land-use.

The sampling density across the slaughterhouse area can detect a potential hot spot across the site with a radius of 12m at a 95% level of confidence.

The sampling density of Stockpile 1 is expected to be sufficient to enable preliminary characterisation.

9.1.4 Sampling depth

Any heavy metals present are generally immobile and expected to be contained in the 0-100mm soil layer which was the target sampling depth as minimal soil disturbance has occurred.

Sampling of the former slaughterhouse location and Stockpile 1 was undertaken at the 50 to 100mm soil layer to enable assessment of volatile hydrocarbons.

9.2 Analytes

Composite soil samples collected from the general site were evaluated for arsenic, cadmium, chromium, copper, lead, nickel and zinc and the discrete soil samples collected were evaluated for organochlorine pesticides (OCP) (Table 1). Heavy metals and OCP were identified as the contaminants of concern possibly present as a result of previous activities.

Discrete soil samples collected from the former slaughterhouse location and stockpiles were analysed for arsenic, cadmium, chromium, copper, lead, nickel, zinc, TRH (C6-C40), BTEXN and PAH (Table 1). Cement sheeting samples collected from the stockpiles were analysed for asbestos.

9.3 Sampling methods

Soil samples were taken using a stainless-steel soil push corer and a hand shovel. Soil was taken at each individual sampling location below the vegetated and detrital layer.

The soil was transferred to a clean plastic bag, mixed and transferred to a solvent rinsed glass jar with a Teflon lid. Four discrete samples were combined to create each composite sample for chemical analysis. Discrete soil samples were transferred directly to a solvent rinsed glass jar with a Teflon lid.

Tools were decontaminated between sampling locations to prevent cross contamination by rinsing with clean water and drying.

Table 1. Schedule of samples and analyses

Sample ID	Type	Discrete sample ID (Figures 2 and 3)	Analysis undertaken
ER1C	Composite	11, 12, 13, 14	Arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), nickel (Ni), zinc (Zn), mercury (Hg)
ER2C	Composite	21, 22, 23, 24	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg
ER3C	Composite	31, 32, 33, 34	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg
ER4C	Composite	41, 42, 43, 44	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg
ER5C	Composite	51, 52, 53, 54	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg
ER6C	Composite	61, 62, 63, 64	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg
ER7C	Composite	71, 72, 73, 74	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg
ER8C	Composite	81, 82, 83, 84	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg
ER9C	Composite	91, 92, 93, 94	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg
ER10C	Composite	101, 102, 103, 104	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg
ER11D	Discrete	11	Zn, Organochlorine pesticides (OCP)
ER12D	Discrete	12	Zn
ER13D	Discrete	13	Zn
ER14D	Discrete	14	Zn
ER21D	Discrete	21	OCP
ER31D	Discrete	31	OCP
ER41D	Discrete	41	OCP
ER51D	Discrete	51	OCP
ER61D	Discrete	61	OCP
ER71D	Discrete	71	OCP
ER81D	Discrete	81	OCP
ER91D	Discrete	91	OCP
ER101D	Discrete	101	OCP
HS1	Discrete	HS1	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, total recoverable hydrocarbons (TRH C6-C40), benzene, toluene, ethylbenzene, xylenes, naphthalene (BTEXN), polycyclic aromatic hydrocarbons (PAH)
HS2	Discrete	HS2	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH (C6-C40), BTEXN, PAH
HS3	Discrete	HS3	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH (C6-C40), BTEXN, PAH
HS4	Discrete	HS4	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH (C6-C40), BTEXN, PAH
HS5	Discrete	HS5	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH (C6-C40), BTEXN, PAH
HS6	Discrete	HS6	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH (C6-C40), BTEXN, PAH
HS7	Discrete	HS7	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH (C6-C40), BTEXN, PAH
HS8	Discrete	HS8	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH (C6-C40), BTEXN, PAH
HS9	Discrete	HS9	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH (C6-C40), BTEXN, PAH
HS10	Discrete	HS10	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH (C6-C40), BTEXN, PAH
HS11	Discrete	HS11	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH (C6-C40), BTEXN, PAH
HS12	Discrete	HS12	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH (C6-C40), BTEXN, PAH
HS13	Discrete	HS13	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH (C6-C40), BTEXN, PAH
HS14	Discrete	HS14	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH (C6-C40), BTEXN, PAH
HS15	Discrete	HS15	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH (C6-C40), BTEXN, PAH
13592-1	-	AS1	Asbestos
13592-2	-	AS2	Asbestos

10. Quality assurance and quality control

10.1 Sampling design

The sampling program is intended to provide data as to the presence and levels of contaminants.

Discrete soil samples were collected across the general site on a systematic grid pattern of 100 metres. This sampling density will enable the detection of an area with an elevated concentration on a radius of 59m with a 95% confidence level.

The number of sampling density is less than the recommended density in the EPA sampling guidelines but expected to be sufficient to enable characterisation due to historical land-use and preliminary nature of the investigation.

Discrete soil samples were collected across the former slaughterhouse location on a systematic grid pattern of 20 metres. This sampling density will enable the detection of an area with an elevated concentration on a radius of 12m with a 95% confidence level.

Discrete soil samples were collected from Stockpile 1 on a judgmental sampling pattern. Sampling locations are expected to be representative of the various types of material within the stockpiles.

10.2 Field

The collection of samples was undertaken in accordance with accepted standard protocols (NEPC 1999). Composite sampling was undertaken to reduce the cost of chemical analysis. Combining equal amounts from four discrete samples created the composite samples. A composite sample represents the average concentration of the sub-sample.

The rules for composite sampling were observed (EPA 1995). All composite samples were analysed for arsenic, cadmium, chromium, copper, lead, nickel and zinc.

Discrete soil samples were also collected from the site.

Sampling equipment was decontaminated between each sampling event. The appropriate storage conditions and duration were observed between sampling and analysis. A chain of custody form accompanied the samples to the laboratory (Appendix 4).

A single sampler was used to collect the samples using standard methods. Soil collected was a fresh sample from a corer and hand shovel. After collection the samples were immediately placed in new glass sampling jars and placed in a cooler.

Two duplicate samples were collected. No field blank, rinsate, trip blank or matrix spikes were submitted for analysis. Some samples from all batches did not contain contaminants which confirm the absence of cross contamination during transport and storage.

A field sampling log is presented in Appendix 3.

10.3 Laboratory

Chemical analysis was conducted by SGS Laboratories, Alexandria, which is NATA accredited for the tests undertaken. The laboratories have quality assurance and quality control programs in place, which include internal replication and analysis of spike samples and recoveries.

Method blanks, matrix duplicates and laboratory control samples were within acceptance criteria. The quality assurance and quality control report is presented together with the laboratory report as Appendix 4.

Asbestos identification was undertaken by EW Testing Services which is NATA accredited for the test undertaken.

10.4 Data evaluation

The laboratory quality control report indicates the data variability is within acceptable industry limits. The data is considered representative and usable for the purposes of the investigation. Data quality indicators are presented in Appendix 2.

11. Assessment criteria

11.1 NEPM assessment

The proposed land-use is residential. The laboratory results were assessed against the land-use of residential with access to soil (*HIL A*). The health-based investigation levels of contaminants in the soil for residential sites, for the substances for which criteria are available, are listed in Table 3, as recommended in the NEPM (1999).

The NEPC (1999) also provides health screening levels (HSL) for hydrocarbons in soil. The HSLs have been developed to be protective of human health for soil types, depths below surface and apply to exposure to hydrocarbons through the predominant vapour exposure pathway. The appropriate HSL for the site is listed in Table 4. TRH>16 have physical properties which make the TRH fractions non-volatiles and therefore these TRH fractions are not applicable for vapour intrusion.

Ecological investigation levels (EIL) have been developed for the protection of terrestrial ecosystems for selected metals and organic substances in the soil in the guideline (NEPC 1999). Ecological screening levels (ESL) assess the risk to terrestrial ecosystems from petroleum hydrocarbons in the soil. The EILs and ESLs consider the properties of the soil and contaminants and the capacity of the local ecosystem to accommodate increases in contaminant levels.

Typical CEC value for the site is >20 to 30cmol(+)/kg, clay content of 30 to 40%, pH values of between 5.5 and 6 and organic carbon of 2 to 3% (NSW Government nd). The proposed land-use is residential (urban residential areas). The contaminants have been identified in the soil for at least two years and are considered aged.

EILs vary with land-use and apply to contaminants up to 2m depth below the surface. The EILs for residential land-use are listed in Table 2.

The investigation threshold was adjusted to enable the detection of an individual location being diluted in the composting process (EPA 1995). For composite sampling, the analyte result was divided against the number of discrete samples making up the composite. This is based on a worst-case scenario in which one sample has a high concentration whilst other discrete samples have zero concentration. This is a conservative approach.

Chromium is analysed as total chromium which is the sum of chromium (III) and chromium (VI). Chromium (VI) is a potential contaminant from industrial processes including ferrochrome production, electroplating, pigment production and tanning (WHO 1998). Chromium (VI) is reduced to chromium (III) when it comes into contact with organic matter in biota, soil and water. Chromium in the environment is present in the trivalent state (WHO 1998).

The threshold for asbestos is nil on the surface.

Table 2. EIL Calculation sheet, residential land-use

Analyte	Rationale	ACL (mg/kg)	ABC (mg/kg)	EIL (mg/kg)
Arsenic	Generic	100	-	100
Chromium (III)	Clay content 40%, aged	640	0	640
Copper	CEC 30cmol/kg, pH 6, organic carbon 3%	210	0	210
Lead	Generic	1,100	0	1,100
Nickel	CEC 30cmol/kg	350	0	350
Zinc	CEC 30cmol/kg, pH 6	480	0	480
DDT	Generic	180	-	180
Naphthalene	Generic	170	-	170

ACL – added contaminant limit, ABC – ambient background concentration, EIL – Ecological investigation limit (ACL+ABC)

Table 3. Soil assessment criteria (mg/kg) (NEPC 1999) for residential land-use

Analyte	HIL A – Residential		EIL – Residential	
	Discrete	Composite	Discrete	Composite
Arsenic	100	25	100	25
Cadmium	20	5	-	-
Chromium (total)	100 ¹	25 ¹	640 ²	160 ²
Copper	6,000	1,500	210	52.5
Lead	300	75	1,100	275
Nickel	400	100	480	120
Zinc	7,400	1,850	270	67.5
Mercury	40	10	-	-
OCP (total)	-	-	-	-
DD	240	-	180	-
Naphthalene	-	-	170	-
Total PAH	300	-	-	-
Carcinogenic PAH	3	-	-	-

¹ Threshold for Chromium (VI), ² Threshold for Chromium (III), HIL- human investigation level, EIL- ecological investigation level.

Table 4. Soil screening levels and management limits (mg/kg) (NEPC 1999) for residential land-use

Analyte	HSL A Residential, clay soil 0 to <1m	ESL Residential and public open space, Fine soil	Management limits for TRH in fine soil / Residential, parkland and public open space
TRH (C6-C10)	50	180	800
TRH (C10-C16)	280	120	1,000
TRH (>C16-C34)	NA	1,300	3,500
TRH (>C34-C40)	NA	5,600	10,000
Benzene	0.7	65	-
Toluene	480	105	-
Ethylbenzene	NL	125	-
Xylenes	110	45	-
Naphthalene	5	-	-
Benzo(a)pyrene	-	0.7	-

HSL – health screening level, ESL – ecological screening level

11.2 Waste classification

The chemical assessment of soil expected to be removed from site and disposed to landfill was made according to *Waste Classification Guidelines Part 1: Classifying Waste* (2014). The assessment thresholds for the waste classification guidelines are displayed in Table 5. Material containing asbestos is classified as Asbestos waste.

Table 5. Waste classification guidelines (mg/kg)

Analyte	Units	General Solid Waste	Restricted Solid Waste
		CT1	CT2
Arsenic	mg/kg	100	400
Cadmium	mg/kg	20	80
Chromium (VI)	mg/kg	100	400
Copper	mg/kg	-	-
Lead	mg/kg	100	400
Nickel	mg/kg	40	160
Zinc	mg/kg	-	-
Mercury	mg/kg	4	16
TPH (C6-C9)	mg/kg	650	2,600
TPH (C10-C36)	mg/kg	10,000	40,000
Benzene	mg/kg	10	40
Toluene	mg/kg	288	1,152
Ethylbenzene	mg/kg	600	2,400
Xylenes	mg/kg	1,000	4,000
PAH	mg/kg	200	800
Benzo(a)pyrene	mg/kg	0.8	3.2

12. Results and discussion

12.1 Site inspection

Vegetation cover on the site was dominated by phalaris with trace broadleaved weeds including plantain. Ruderal weeds are present in previously disturbed areas including on stockpiles and in the former slaughterhouse location. Remnant eucalypt trees are present in the central and southern sections of the site. Ornamental plant species are located around the dwelling. Vegetation cover within the investigation area was 100%.

Wastewater produced from the dwelling is serviced by an on-site effluent system comprising a septic tank and absorption trench.

A review of site history indicated that historical land-use at the site was grazing. A small slaughterhouse historically operated from the south eastern section of the site. Slaughterhouse infrastructure has been removed.

Stockpiles (Stockpile 1) have been created south east of the former slaughterhouse location from clean up works around the slaughterhouse and across the site. Stockpile 1 comprised sandy clay with gravel and inert foreign materials including concrete, bricks, tiles and cement sheeting.

A stockpile (Stockpile 2) is located along the eastern boundary of the site (Figure 2). Stockpile 2 comprised brown sandy clay vegetated with variegated thistle. Source of the stockpiled material is not known.

Trace inert debris including mop buckets, plastic pots, plastic and paper were identified in the location of the former slaughterhouse and in the north western section of the site. Concrete blocks were identified in the western section of the site. The debris is an amenity issue.

No evidence of fill, mines, sheep dips or mixing sheds were identified on the site from the review of site history or site inspection.

12.2 NEPM assessment

Levels of metals in composite samples collected across the general site were generally less than the adopted thresholds (Table 6). Levels of total chromium exceeded the adopted HIL for hexavalent chromium. Analysis for hexavalent chromium identified very low levels to below laboratory detection limits for all samples indicating total chromium predominantly comprised trivalent chromium. Levels of hexavalent chromium was less than the adopted HIL and levels of trivalent chromium was less than the adopted EIL.

Zinc exceeded the EIL in sample ER1C (Table 6). Assessment of the discrete samples making up composite sample ER1C identified levels of zinc less than the EIL (Table 6).

OCP were not detected in the samples (Table 6) and was less than the adopted thresholds.

Levels of heavy metals were less than adopted thresholds in samples collected from the former slaughterhouse location (Table 7). Low levels of TRH (>C10-C16) were identified in one sample at levels less than adopted thresholds (Table 8). Hydrocarbons were at levels less than the detection limit in other samples.

Table 6. Analytical results and threshold concentrations, general site (mg/kg)

Sample ID	Sample type	Arsenic	Cadmium	Chromium (total)	Hexavalent chromium	Copper	Lead	Nickel	Zinc	OCP	DDs
ER1C	Composite	5	<0.3	46	0.6	38	17	14	230	-	-
ER2C	Composite	4	<0.3	54	<0.5	33	7	23	72	-	-
ER3C	Composite	5	<0.3	37	0.7	36	5	17	57	-	-
ER4C	Composite	4	<0.3	33	<0.5	42	9	16	97	-	-
ER5C	Composite	4	<0.3	36	<0.5	34	12	9.5	50	-	-
ER6C	Composite	4	<0.3	16	-	37	6	8.9	69	-	-
ER7C	Composite	6	<0.3	35	<0.5	34	5	16	56	-	-
ER8C	Composite	4	<0.3	56	<0.5	45	5	24	64	-	-
ER9C	Composite	5	<0.3	27	<0.5	43	6	11	54	-	-
ER10C	Composite	6	<0.3	38	0.7	28	14	11	39	-	-
ER11D	Discrete	-	-	-	-	-	-	-	53	<1	<0.1
ER12D	Discrete	-	-	-	-	-	-	-	65	-	-
ER13D	Discrete	-	-	-	-	-	-	-	100	-	-
ER14D	Discrete	-	-	-	-	-	-	-	45	-	-
ER21D	Discrete	-	-	-	-	-	-	-	-	<1	<0.1
ER31D	Discrete	-	-	-	-	-	-	-	-	<1	<0.1
ER41D	Discrete	-	-	-	-	-	-	-	-	<1	<0.1
ER51D	Discrete	-	-	-	-	-	-	-	-	<1	<0.1
ER61D	Discrete	-	-	-	-	-	-	-	-	<1	<0.1
ER71D	Discrete	-	-	-	-	-	-	-	-	<1	<0.1
ER81D	Discrete	-	-	-	-	-	-	-	-	<1	<0.1
ER91D	Discrete	-	-	-	-	-	-	-	-	<1	<0.1
ER101D	Discrete	-	-	-	-	-	-	-	-	<1	<0.1
Health Investigation Levels- Residential land-use threshold (NEPC 1999)											
Discrete		100	20	100 ¹	100	6,000	300	400	7,400	-	240
Composite		25	5	25 ¹	25	1,500	75	100	1,850	-	-
Ecological Investigation Levels- Urban residential and public open space land-use threshold (NEPC 1999)											
Discrete		100	-	640 ²	-	210	1,100	480	270	-	180
Composite		25	-	160 ²	-	52.5	275	120	67.5	-	-

¹ Chromium (IV), ² Chromium (III)

Table 7. Analytical results and threshold concentrations, hot spots – metals and PAH (mg/kg)

Sample ID	Arsenic	Cadmium	Chromium (total)	Copper	Lead	Nickel	Zinc	Mercury	Total PAH	Carcinogenic PAH
HS1	4	<0.3	32	42	6	13	60	<0.05	<0.8	<0.3
HS2	8	<0.3	28	45	14	8.0	88	0.07	<0.8	<0.3
HS3	4	<0.3	16	32	6	5.8	68	<0.05	<0.8	<0.3
HS4	6	<0.3	12	49	7	6.5	85	<0.05	<0.8	<0.3
HS5	5	<0.3	42	47	10	16	74	<0.05	<0.8	<0.3
HS6	5	<0.3	31	39	8	9.5	130	<0.05	<0.8	<0.3
HS7	5	<0.3	26	31	6	11	46	<0.05	<0.8	<0.3
HS8	4	<0.3	23	25	8	6.8	47	<0.05	<0.8	<0.3
HS9	7	<0.3	49	46	16	17	120	<0.05	<0.8	<0.3
HS10	4	<0.3	28	59	13	14	170	<0.05	<0.8	<0.3
Health Investigation Levels- Residential land-use threshold (NEPC 1999)										
	100	20	100 ¹	6,000	300	400	7,400	40	300	3
Ecological Investigation Levels- Urban residential and public open space land-use threshold (NEPC 1999)										
	100	-	640 ²	210	1,100	480	270	-	-	-

¹ Chromium (IV), ² Chromium (III)**Table 8.** Analytical results and threshold concentrations, hot spots – hydrocarbons (mg/kg)

Sample ID	TRH (C6-C10)	TRH (>C10-C16)	TRH (>C16-C34)	TRH (>C34-C40)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	Benzo(a)pyrene
HS1	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1
HS2	<25	29	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1
HS3	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1
HS4	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1
HS5	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1
HS6	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1
HS7	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1
HS8	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1
HS9	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1
HS10	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1
HSL A – residential clay soil 0m to <1m										
	50	280	NA	NA	0.7	480	NL	110	5	-
EIL – residential and public open space										
	-	-	-	-	-	-	-	-	170	-
ESL – residential/recreational fine soil										
	180	120	1,300	5,600	65	105	125	45	-	0.7
Management limits – residential/ recreational										
	800	1,000	3,500	10,000	-	-	-	-	-	-

EIL – ecological investigation level, HSL – health screening level, ESL – ecological screening level

12.3 Waste classification

Numerous stockpiles were identified in the south eastern section of the site south east of the former slaughterhouse locations. The stockpiles are reportedly from clean up works associated with the slaughterhouse infrastructure as well as the general site. Material in the stockpiles included brown to strong brown sandy clay with gravel. Foreign materials including concrete, brick, cement sheeting, cobbles and tiles were identified throughout the stockpiles. Cement sheeting fragments were also identified between stockpiles.

Asbestos was identified in sample 13592-2 collected from between the stockpiles (Appendix 5). Asbestos was not identified in sample 13592-1.

Average and 95% upper confidence intervals for all samples and analytes were less than the general solid waste (CT1) thresholds (Tables 9 and 10). The stockpiled material is classified as asbestos waste with a subclassification of general solid waste.

Table 9. Analytical results and threshold concentrations – metals (mg/kg)

Sample ID	Arsenic	Cadmium	Chromium (total)	Copper	Lead	Nickel	Zinc	Mercury
HS11	9	<0.3	39	44	6	13	49	<0.05
HS12	4	<0.3	110	58	6	35	45	<0.05
HS13	17	0.3	19	82	12	9.8	1,900	<0.05
HS14	5	<0.3	22	20	13	9.3	69	<0.05
HS15	4	<0.3	61	47	12	31	65	<0.05
Average	7.8	-	50.2	50.2	9.8	19.6	425.6	-
95% UCI	12.7	-	83.0	70.0	12.9	30.5	1,148.1	-
CT1	100	20	100 ¹	-	100	40	-	4
CT2	400	80	400 ¹	-	400	160	-	16

¹ Threshold for Chromium (VI), bold indicates threshold exceedance

Table 10. Analytical results and threshold concentrations, hot spots – hydrocarbons (mg/kg)

Sample ID	TRH (C6-C9)	TRH (C10-C36)	Benzene	Toluene	Ethylbenzene	Xylenes	Total PAH	Benzo(a)pyrene
HS11	<20	<110	<0.1	<0.1	<0.1	<0.3	<0.8	<0.1
HS12	<20	<110	<0.1	<0.1	<0.1	<0.3	<0.8	<0.1
HS13	<20	<110	<0.1	<0.1	<0.1	<0.3	<0.8	<0.1
HS14	<20	<110	<0.1	<0.1	<0.1	<0.3	<0.8	<0.1
HS15	<20	<110	<0.1	<0.1	<0.1	<0.3	<0.8	<0.1
CT1	650	10,000	10	288	600	1,000	200	0.8
CT2	2,600	40,000	40	1,152	2,400	4,000	800	3.2

EIL – ecological investigation level, HSL – health screening level, ESL – ecological screening level

13. Site characterisation

13.1 Environmental contamination

Asbestos containing materials were identified in the stockpiles located south east of the former slaughterhouse location.

Trace inert debris was identified at various locations across the site.

13.2 Chemical degradation production

Asbestos do not degrade

Inert debris does not degrade.

13.3 Exposed population

13.3.1 Human health

The asbestos is classified as non-friable and will be a health hazard to people accessing the site if disturbed.

The inert debris is an amenity hazard.

13.3.2 Environment

Impacts on the environment are not expected from the presence of asbestos.

14. Conclusions and recommendations

14.1 Summary

An inspection of the site was made on 27 August and 27 September 2021. Land-use on the site is currently rural-residential. A dwelling is present in the central western section of the site. The dwelling is serviced by an on-site effluent system.

The site had a grazing land-use history. The use of agricultural pesticides over the area in the past is expected to be low. Vegetation cover within the investigation area was 100% with groundcover vegetation dominated by phalaris. Remnant eucalypt trees occur in the central and southern sections.

A small slaughterhouse historically operated from the south eastern section of the site. Slaughterhouse infrastructure has been removed. Levels of potential contaminants in samples collected from the former slaughterhouse location were less than adopted thresholds.

Two areas of stockpiles are present. Stockpile 1 is located in the south eastern section of the site and comprises material generated from site cleanup works including around the former slaughterhouse. Asbestos containing materials were identified in the stockpiles. Level of potential contaminants were below general solid waste thresholds. The material is classified as asbestos waste with a subclassification of general solid waste and requires removal and disposal to landfill.

Source of material within Stockpile 2 is not known. Characterisation of the material is required to determine suitability for remaining on-site or off-site re-use or disposal.

Trace inert debris were identified in the location of the former slaughterhouse, in the north western section and western section of the site. The debris is an amenity issue.

No evidence of mines, sheep dips or mixing sheds were identified on the site from the review of site history or site inspection.

The soil sampling program did not detect elevated levels of analysed metals across the general site. OCP were not detected in the samples collected across the general site. The levels of all other substances evaluated were below the adopted thresholds for residential land-use with access to soil.

14.2 Assumptions in reaching the conclusions

It is assumed the sampling sites are representative of the site. An accurate history has been obtained and typical past farming practices were adopted.

14.3 Extent of uncertainties

The analytical data relate only to the locations sampled. Soil conditions can vary both laterally and vertically and it cannot be excluded that unidentified contaminants may be present. The sampling density was designed to detect a 'hot spot' within a radius of approximately 59m and with a 95% level of confidence.

14.4 Suitability for proposed use of the site

The site is suitable for proposed residential land-use following removal of the asbestos impacted stockpiles.

14.5 Limitations and constraints on the use of the site

Nil

14.6 Recommendation for further work

The stockpiles south east of the former slaughterhouse require removal and disposal to landfill as asbestos waste with a sub-classification of general solid waste. A clearance certificate should be issued following removal works to confirm satisfactory removal of asbestos containing materials.

The stockpile in the eastern section of the site should be assessed based on end use. Material remaining on-site should be assessed for suitability for residential land-use. Material to be removed from site for re-use should be assessed in accordance with the NSW EPA ENM Exemption.

The on-site septic tank requires decommissioning in accordance with NSW Health Advisory Note 3. The absorption trench should be decommissioned by cultivation and incorporation of lime.

An unexpected finds procedure should be adopted for site development works.

15. Report limitations and intellectual property

This report has been prepared for the use of the client to achieve the objectives given the clients requirements. The level of confidence of the conclusion reached is governed by the scope of the investigation and the availability and quality of existing data. Where limitations or uncertainties are known, they are identified in the report. No liability can be accepted for failure to identify conditions or issues which arise in the future and which could not reasonably have been predicted using the scope of the investigation and the information obtained.

The investigation identifies the actual subsurface conditions only at those points where samples are taken, when they are taken. Data derived through sampling and subsequent laboratory testing is interpreted by geologists, engineers or scientists who then render an opinion about overall subsurface conditions, the nature and extent of the 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 well qualified, and no sub-surface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock or 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. It is thus important to understand the limitations of the investigation and recognise that we are not responsible for these limitations.

This report, including data contained and its findings and conclusions, remains the intellectual property of Envirowest Consulting Pty Ltd. A licence to use the report for the specific purpose identified is granted for the persons identified in that section after full payment for the services involved in preparation of the report. This report should not be used by persons or for purposes other than those stated and should not be reproduced without the permission of Envirowest Consulting Pty Ltd.

16. References

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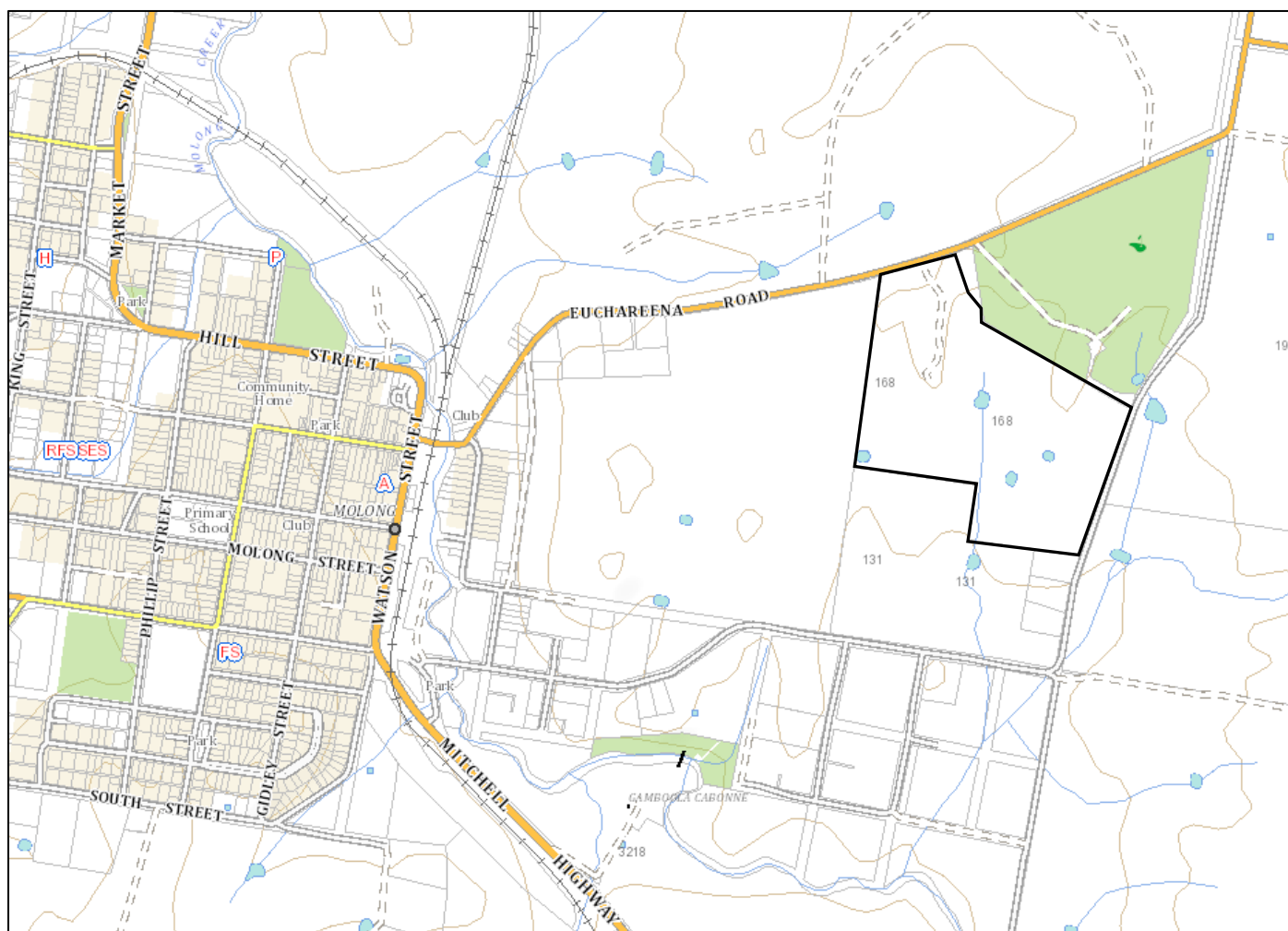
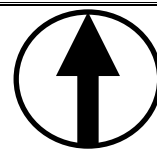
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Figures



Legend

— Investigation area

Figure 1. Locality map

Golf Course Heights Estate Euchareena Road, Molong NSW

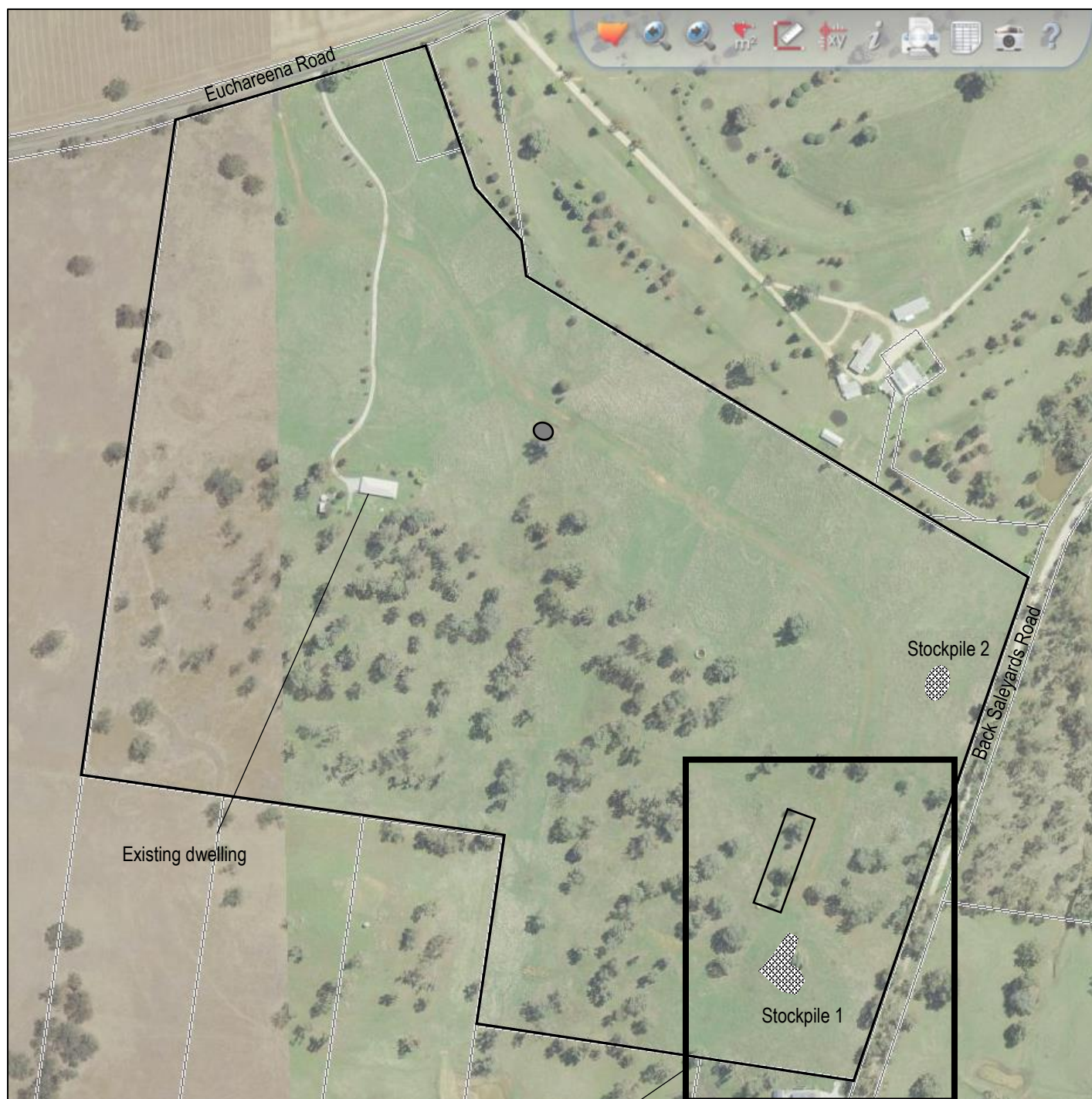
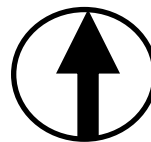


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Date: 21/9/2021



See Figure 4

Legend

-  Investigation area
-  Dam
-  Stockpiles
-  Former slaughterhouse location

Figure 2. Site layout

Golf Course Heights Estate Euchareena Road, Molong NSW

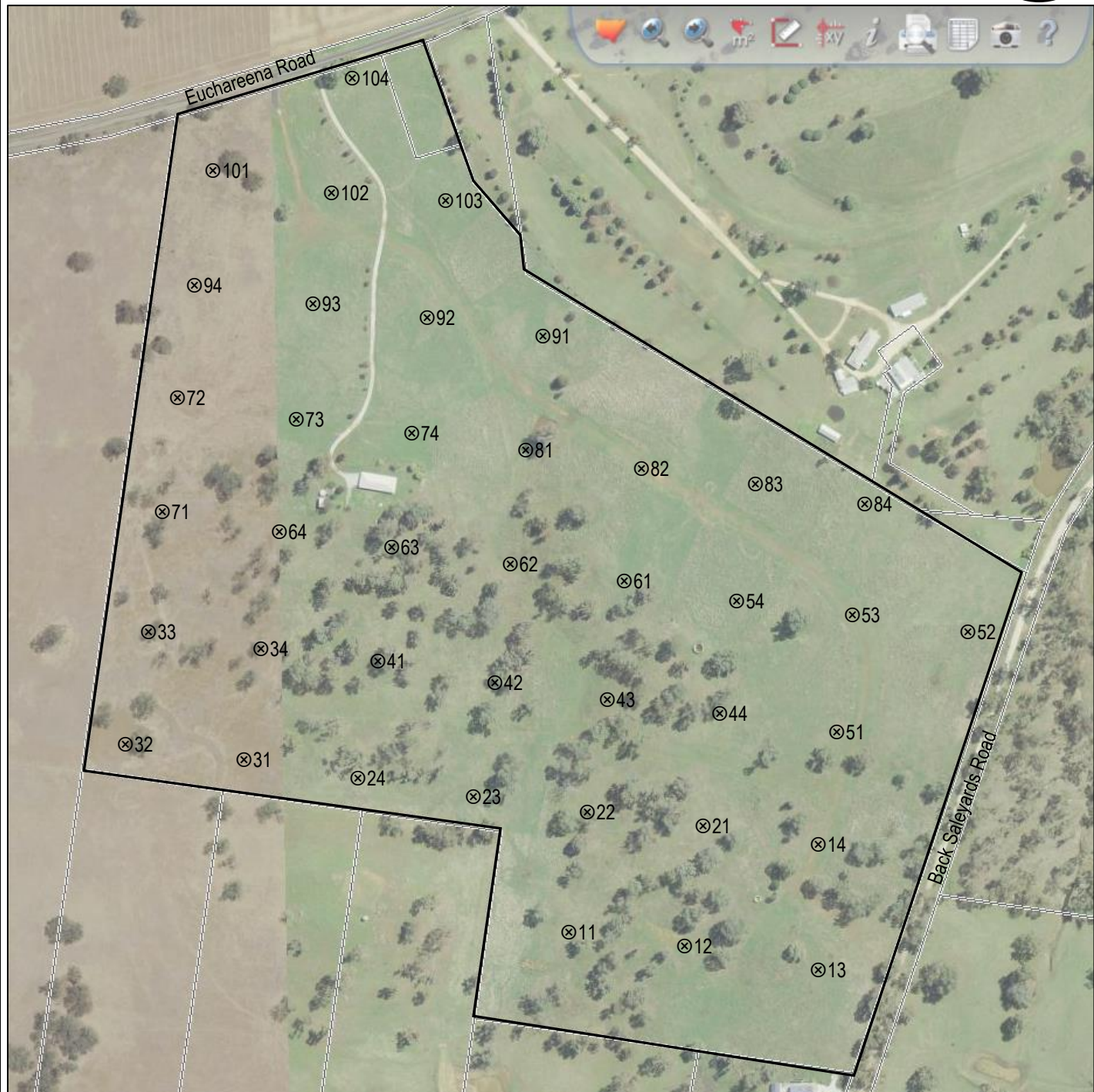
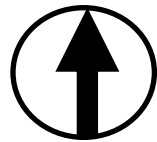


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Date: 21/9/2021



Legend

— Investigation area

⊗ Approximate sampling locations

Approximate Scale 1: 5,000



Figure 3. General site sampling locations

Golf Course Heights Estate Euchareena Road, Molong NSW

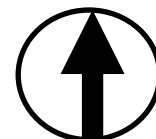


Envirowest Consulting Pty Ltd

Job: R13592c

Drawn by: LD

Date: 21/9/2021



Legend

- Investigation area
- ⊗ Approximate soil sampling locations
- ⊠ Approximate building material sampling locations

Approximate Scale 1: 1,600



Figure 4. Hot spot sampling locations

Golf Course Heights Estate Euchareena Road, Molong NSW



Envirowest Consulting Pty Ltd

Job: R13592c

Drawn by: LD

Date: 21/9/2021

Figure 5. Photographs of the site



Looking over the general site



Looking south across site



Former slaughterhouse location



Stockpile 1 from site cleanup



Stockpile 1 from site cleanup



Stockpile 1 from site cleanup



Ash stockpile (HS13) within Stockpile 1



Asbestos cement sheeting fragments

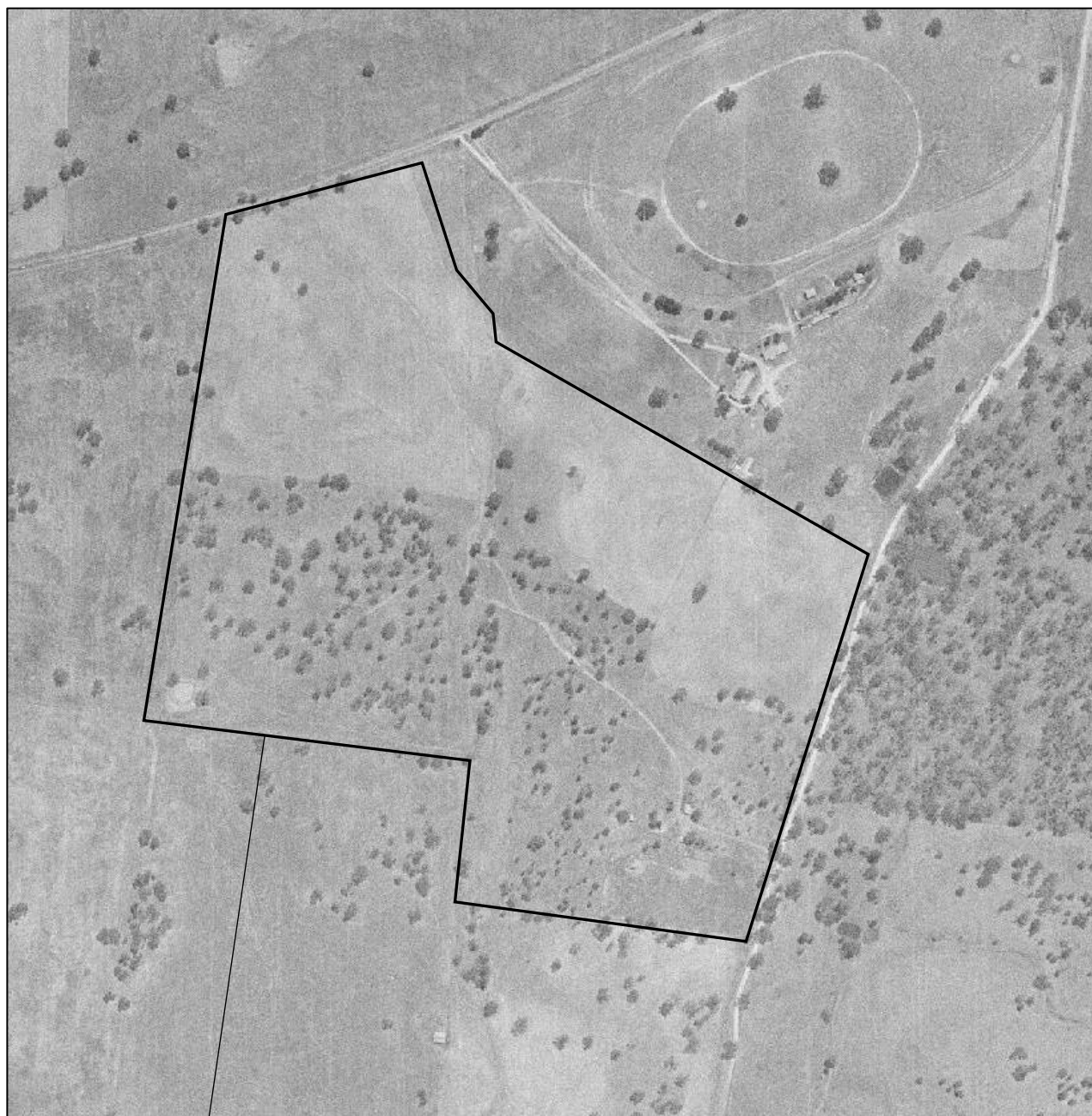
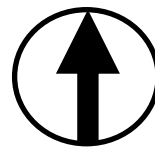


Stockpile 2



Concrete blocks in western section of site

Appendices

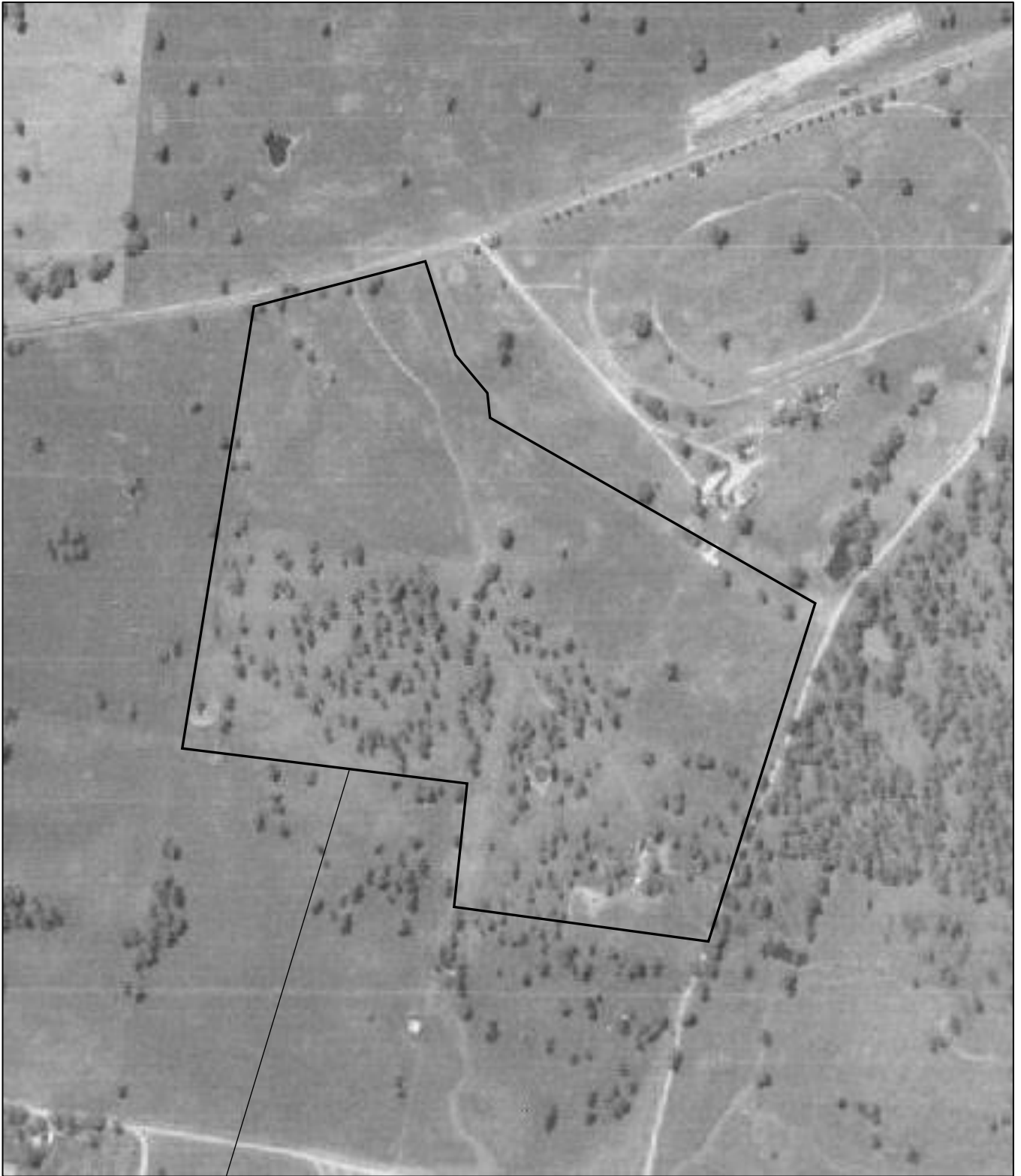
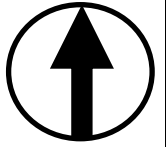


Investigation area

Approximate Scale 1: 6,300



Appendix 1.1 1964 Aerial photograph		
Golf Course Heights Estate Euchareena Road, Molong NSW		
	Envirowest Consulting Pty Ltd	
Job: R13592c	Drawn by: LD	Date: 26/8/2021

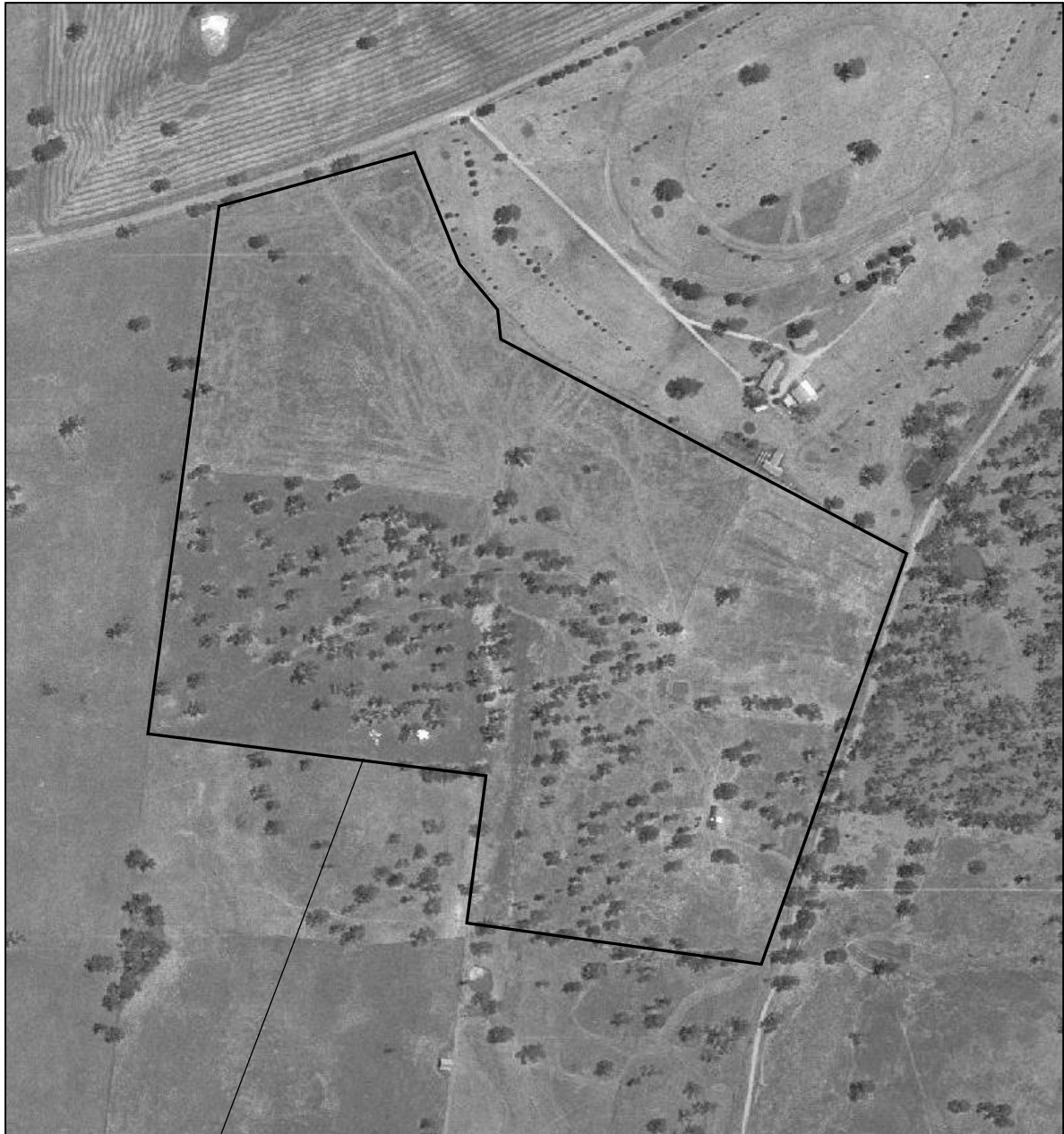
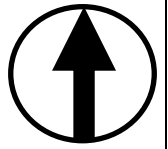


Investigation area

Approximate Scale 1: 6,300



Appendix 1.2 1973 Aerial photograph		
Golf Course Heights Estate Euchareena Road, Molong NSW		
		Envirowest Consulting Pty Ltd
Job: R13592c	Drawn by: LD	Date: 26/8/2021

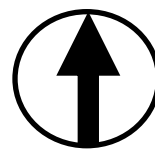


Investigation area

Approximate Scale 1: 6,300



Appendix 1.3 1982 Aerial photograph		
Golf Course Heights Estate Euchareena Road, Molong NSW		
	Envirowest Consulting Pty Ltd	
Job: R13592c	Drawn by: LD	Date: 26/8/2021

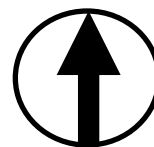


Investigation area

Approximate Scale 1: 6,300



Appendix 1.4 1989 Aerial photograph		
Golf Course Heights Estate Euchareena Road, Molong NSW		
	Envirowest Consulting Pty Ltd	
Job: R13592c	Drawn by: LD	Date: 26/8/2021

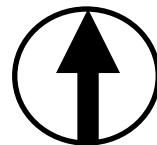


Investigation area

Approximate Scale 1: 6,300



Appendix 1.5 1993 Aerial photograph		
Golf Course Heights Estate Euchareena Road, Molong NSW		
	Envirowest Consulting Pty Ltd	
Job: R13592c	Drawn by: LD	Date: 26/8/2021

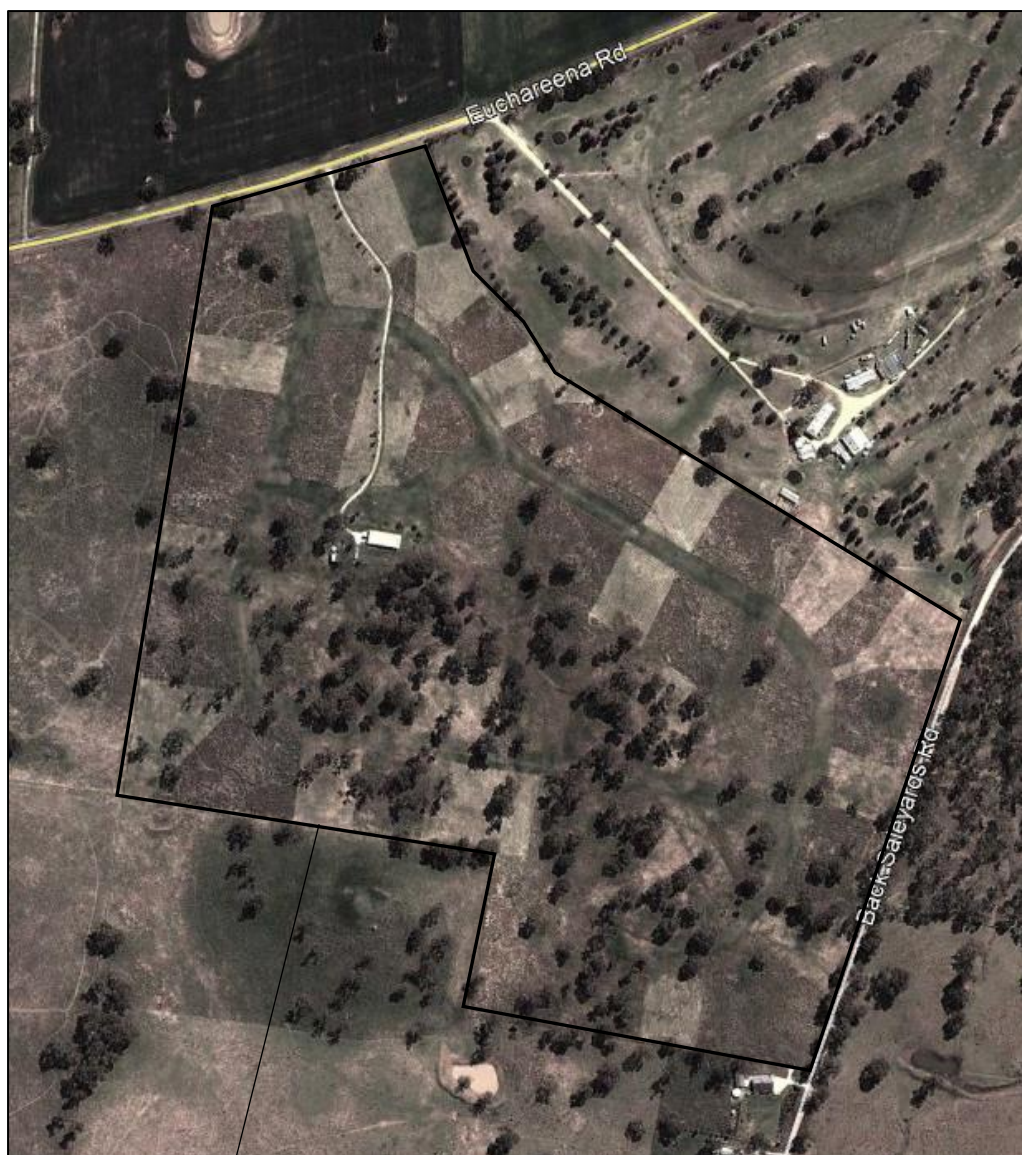
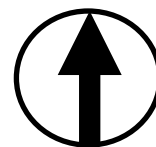


Investigation area

Approximate Scale 1: 6,300



Appendix 1.6 2007 Aerial photograph		
Golf Course Heights Estate Euchareena Road, Molong NSW		
		Envirowest Consulting Pty Ltd
Job: R13592c	Drawn by: LD	Date: 26/8/2021

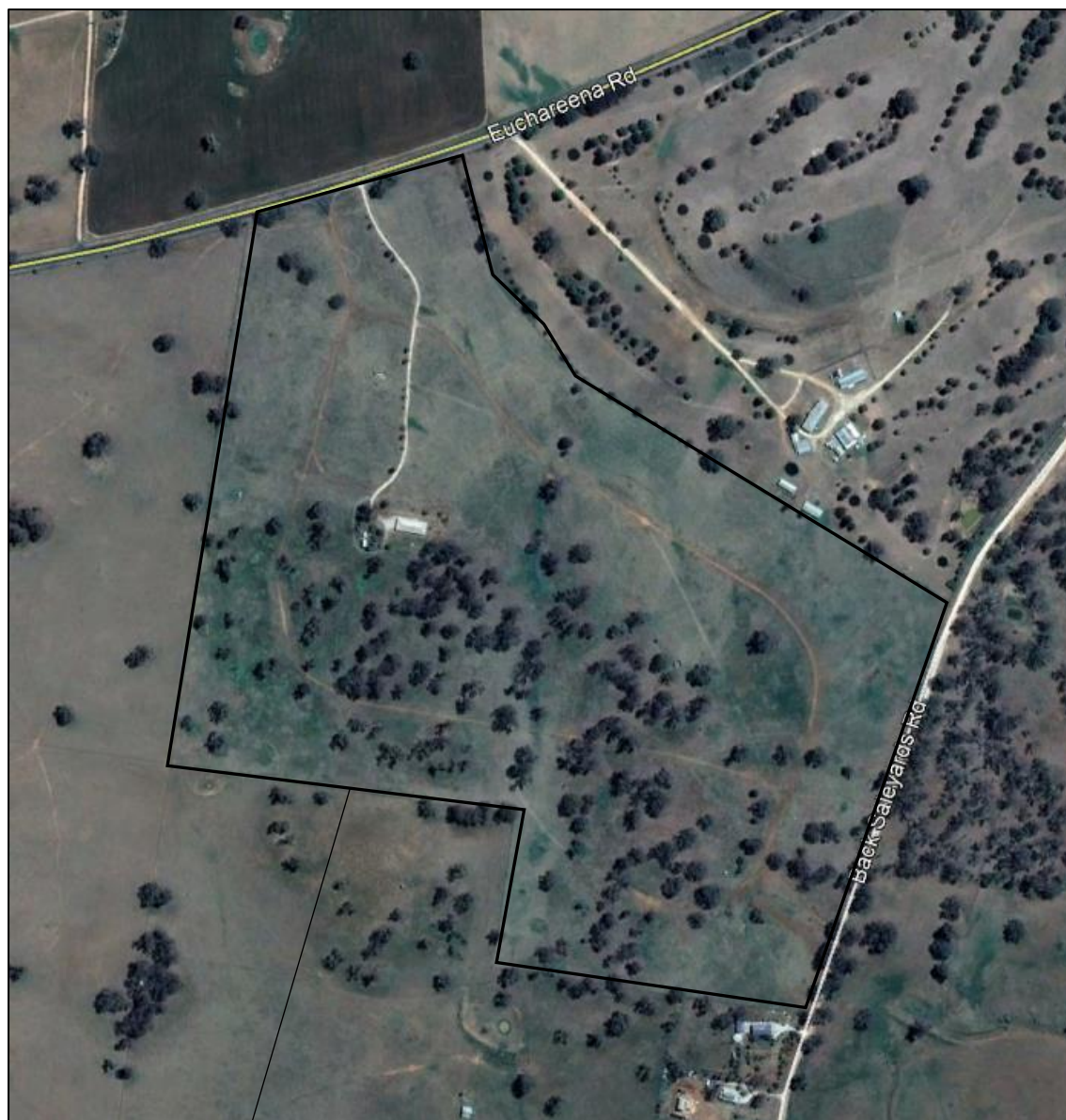
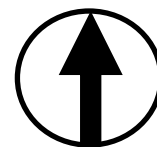


Investigation area

Approximate Scale 1: 6,300



Appendix 1.7 2011 Aerial photograph		
Golf Course Heights Estate Euchareena Road, Molong NSW		
	Envirowest Consulting Pty Ltd	
Job: R13592c	Drawn by: LD	Date: 26/8/2021



Investigation area

Approximate Scale 1: 6,300



Appendix 1.8 2020 Aerial photograph		
Golf Course Heights Estate Euchareena Road, Molong NSW		
	Envirowest Consulting Pty Ltd	
Job: R13592c	Drawn by: LD	Date: 26/8/2021

Appendix 2. Sample analysis, quality assurance and quality control (QAQC) report

1. Data quality indicators (DQI) requirements

1.1 Completeness

A measure of the amount of usable data for a data collection activity. Greater than 95% of the data must be reliable based on the quality objectives. Where greater than two quality objectives have less reliability than the acceptance criterion the data may be considered with uncertainty.

1.1.1 Field

Consideration	Requirement
Locations and depths to be sampled	Described in the sampling plan. The acceptance criterion is 95% data retrieved compared with proposed. Acceptance criterion is 100% in crucial areas.
SOP appropriate and compiled	Described in the sampling plan.
Experienced sampler	Sampler or supervisor
Documentation correct	Sampling log and chain of custody completed

1.1.2 Laboratory

Consideration	Requirement
Samples analysed	Number according to sampling and quality plan
Analytes	Number according to sampling and quality plan
Methods	EPA or other recognised methods with suitable PQL
Sample documentation	Complete including chain of custody and sample description
Sample holding times	Metals 6 months, OCP 14 days

1.2 Comparability

The confidence that data may be considered to be equivalent for each sampling and analytical event. The data must show little or no inconsistencies with results and field observations.

1.2.1 Field

Consideration	Requirement
SOP	Same sampling procedures to be used
Experienced sampler	Sampler or supervisor
Climatic conditions	Described as may influence results
Samples collected	Sample medium, size, preparation, storage, transport

1.2.2 Laboratory

Consideration	Requirement
Analytical methods	Same methods, approved methods
PQL	Same
Same laboratory	Justify if different
Same units	Justify if different

1.3 Representativeness

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

1.3.1 Field

Consideration	Requirement
Appropriate media sampled	Sampled according to sampling and quality plan or in accordance with the EPA (1995) sampling guidelines.
All media identified	Sampling media identified in the sampling and quality plan. Where surface water bodies on the site sampled.

1.3.2 Laboratory

Consideration	Requirement
Samples analysed	Blanks

1.4 Precision

A quantitative measure of the variability (or reproduced of the data). Is measured by standard deviation or relative percent difference (RPD). An RPD analysis is calculated and compared to the practical quantitation limit (PQL) or absolute difference AD.

- Levels greater than 10 times the PQL the RPD is 50%
- Levels between 5 and 10 times the PQL the RPD is 75%
- Levels between 2 and 5 times the PQL the RPD is 100%
- Levels less than 2 times the PQL, the AD is less than 2.5 times the PQL

Data not conforming to the acceptance criterion will be examined for determination of suitability for the purpose of site characterisation.

1.4.1 Field

Consideration	Requirement
Field duplicates	Frequency of 5%, results to be within RPD or discussion required indicate the appropriateness of SOP

1.4.2 Laboratory

Consideration	Requirement
Laboratory and inter lab duplicates	Frequency of 5%, results to be within RPD or discussion required. Inter laboratory duplicates will be one sample per batch.
Field duplicates	Frequency of 5%, results to be within RPD or discussion required
Laboratory prepared volatile trip spikes	One per sampling batch, results to be within RPD or discussion required

1.5 Accuracy

A quantitative measure of the closeness of the reported data to the true value.

1.5.1 Field

Consideration	Requirement
SOP	Complied
Inter laboratory duplicates	Frequency of 5%. Analysis criterion 60% RPD for levels greater than 10 times the PQL 85% RPD for levels between 5 to 10 times the PQL 100% RPD at levels between 2 to 5 times the PQL Absolute difference, 3.5 times the PQL where levels are, 2 times PQL

1.5.2 Laboratory

Recovery data (surrogates, laboratory control samples and matrix spikes) data subject to the following control limits:

- 60-140% acceptable data
- 20-60% discussion required, may be considered acceptable
- 10-20% data should considered as estimates
- 10% data should be rejected

Consideration	Requirement
Field blanks	Frequency of 5%, <5 times the PQL, PQL may be adjusted
Rinsate blanks	Frequency of 5%, <5 times the PQL, PQL may be adjusted
Method blanks	Frequency of 5%, <5 times the PQL, PQL may be adjusted
Matrix spikes	Frequency of 5%, results to be within +/-40% or discussion required
Matrix duplicates	Sample injected with a known concentration of contaminants with tested. Frequency of 5%, results to be within +/-40% or discussion required
Surrogate spikes	QC monitoring spikes to be added to samples at the extraction process in the laboratory where applicable. Surrogates are closely related to the organic target analyte and not normally found in the natural environment. Frequency of 5%, results to be within +/-40% or discussion required
Laboratory control samples	Externally prepared reference material containing representative analytes under investigation. These will be undertaken at one per batch. It is to be within +/-40% or discussion required
Laboratory prepared spikes	Frequency of 5%, results to be within +/-40% or discussion required

2. Laboratory analysis summary

Two analysis batches were undertaken over the preliminary investigation program. Samples were collected on 27 August and 27 September 2021. A total of 38 samples were submitted for analytical testing. The samples were collected in the field by an environmental scientist from Envirowest Consulting Pty Ltd, placed into laboratory prepared receptacles as recommended in NEPM (1999). The samples preservation and storage was undertaken using standard industry practices. A chain of custody form accompanied transport of the samples to the laboratory.

The samples were analysed at the laboratories of SGS Laboratories, Alexandria NSW which is National Association of Testing Authorities (NATA) accredited for the tests undertaken. The analyses undertaken, number of samples tested and methods are presented in the following tables:

Laboratory analysis schedule

Sample id.	Number of samples	Duplicate	Analyses	Date collected	Substrate	Laboratory report
ER1C, ER2C, ER3C, ER4C, ER5C, ER6C, ER7C, ER8C, ER9C, ER10C	10	1	As, Cd, Cr, Cu, Pb, Ni, Zn	27/8/2021	Soil	SE223464
ER1C, ER2C, ER3C, ER4C, ER5C, ER7C, ER8C, ER9C, ER10C	9	0	Cr (VI)	27/8/2021	Soil	SE223464A
ER11D, ER21D, ER31D, ER41D, ER51D, ER61D, ER71D, ER81D, ER91D, ER101D	10	2	OCP	27/8/2021	Soil	SE223464
HS1, HS2, HS3, HS4, HS5, HS6, HS7, HS8, HS9, HS10, HS11, HS12, HS13, HS14, HS15	15	1	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH, BTEXN, PAH	27/8/2021	Soil	SE223464
ER11D, ER12D, ER13D, ER14D	4	0	Zn	27/9/2021	Soil	SE224091

Analytical methods

Analyte	Extraction	Laboratory methods
Metals	USEPA 200.2 Mod	APHA USEPA SW846-6010
Chromium (III)	-	APHA 3500 CR-A&B & 3120 and USEPA SW846-3060A
Chromium (VI)	USEPA SW846-3060A	USEPA SW846-3060A

Mercury	USEPA 200.2 Mod	APHA 3112
TRH(C6-C9)	USPEA SW846-5030A	USPEA SW 846-8260B
TRH(C10-C40), PAH	Tumbler extraction of solids	USEPA SW 846-8270B
PCB	Tumbler extraction of solids	USEPA SW 846-8270B
BTEX	Tumbler extraction of solids	USEPA SW 846-8260B
OC Pesticides	Tumbler extraction of solids	USEPA SW 846-8270B

3. Field quality assurance and quality control

Two intra laboratory duplicate samples were collected for the investigation. The frequency was 5% which was in accordance with the recommended frequency of 5%. Table A1 outlines the samples collected and differences in replicate analyses. Relative differences were deemed to pass if they were within the acceptance limits of +/- 40% for replicate analyses or less than 5 times the detection limit.

Field duplicate frequency

Sample id.	Number of samples	Duplicate	Frequency (%)	Date collected	Substrate	Laboratory report
ER1C, ER2C, ER3C, ER4C, ER5C, ER6C, ER7C, ER8C, ER9C, ER10C, ER11D, ER21D, ER31D, ER41D, ER51D, ER61D, ER71D, ER81D, ER91D, ER101D, HS1, HS2, HS3, HS4, HS5, HS6, HS7, HS8, HS9, HS10, HS11, HS12, HS13, HS14, HS15, ER12D, ER13D, ER14D	38	2	5	27/8/2021	Soil	SE223464 and SE223464

Table A1. Relative differences for intra laboratory duplicates

	ER3C, ERDA		HS11, HAS	
	Relative difference (%)	Pass/Fail	Relative difference (%)	Pass/Fail
Arsenic	33	Pass	25	Pass
Cadmium	NA	-	NA	-
Chromium	17	Pass	60	Fail
Copper	5	Pass	23	Pass
Lead	0	Pass	15	Pass
Nickel	6	Pass	30	Pass
Zinc	5	Pass	13	Pass
Mercury	-	-	NA	-

NA – relative difference unable to be calculated as results are less than laboratory detection limit, * results less than 5 times laboratory detection limits, ^ small exceedance not expected to impact on results

No trip blanks or spikes were submitted for analysis. This is not considered to create significant uncertainty in the analysis results because of the following rationale:

- The fieldwork was completed within a short time period and consistent methods were used for soil sampling.
- Soil samples were placed in insulated cooled containers after sampling to ensure preservation during transport and storage.
- The samples were placed in single use jars using clean sampling tools and disposable gloves from material not in contact with other samples. This reduces the likelihood of cross contamination.

- Samples in the analysis batch contain analytes below the level of detection. It is considered unlikely that contamination has occurred as a result of transport and handling.

4. Laboratory quality assurance and quality control

Sample holding times are recommended in NEPM (1999). The time between collection and extraction for all samples was less than the criteria listed below:

Analyte	Maximum holding time
Metals	6 months
Mercury	28 days
BTEXN, TRH, OCP, OPP	14 days

The laboratory interpretative reports are presented with individual laboratory report. Assessment is made of holding time, frequency of control samples and quality control samples. Holding time outliers were identified for OCP, PAH, TRH and BTEXN due to COVID related courier issues. Outliers not expected to impact on conclusions. The laboratory report also contains a detailed description of preparation methods and analytical methods.

The results, quality report, interpretative report and chain of custody are presented in the attached appendices. The quality report contains the laboratory duplicates, spikes, laboratory control samples, blanks and where appropriate matrix spike recovery (surrogate).

5. Data quality indicators (DQI)

5.1 Completeness

A measure of the amount of usable data for a data collection activity (total to be greater than 90%)

5.1.1 Field

Consideration	Accepted	Comment
Locations to be sampled	Yes	In accordance with sampling methodology, described in the report.
SOP appropriate and compiled	Yes	In accordance with sampling methodology
Experienced sampler	Yes	Environmental scientist
Documentation correct	Yes	Chain of custody completed

5.1.2 Laboratory

Consideration	Accepted	Comment
Samples analysed	Yes	In accordance with chain of custody and analysis plan.
Analytes	Yes	In accordance with chain of custody and analysis plan.
Methods	Yes	Analysed in NATA accredited laboratory with recognised methods and suitable PQL
Sample documentation	Yes	Completed including chain of custody and sample results and quality results
Sample holding times	No	Metals < 6 months Mercury < 28 days OCP, OPP, PAH, TRH, PCB, BTEXN < 14 days

5.2 Comparability

The confidence that data may be considered to be equivalent for each sampling and analytical event.

5.2.1 Field

Consideration	Accepted	Comment
SOP	Yes	Same sampling procedures used and sampled on one date
Experienced sampler	Yes	Experienced environmental scientist
Climatic conditions	Yes	Sampling log
Samples collected	Yes	Suitable size and storage

5.2.2 Laboratory

Consideration	Accepted	Comment
Analytical methods	Yes	Same methods all samples
PQL	Yes	Suitable for analytes
Same laboratory	Yes	-
Same units	Yes	-

5.3 Representativeness

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

5.3.1 Field

Consideration	Accepted	Comment
Appropriate media sampled	Yes	Sampled according to sampling and quality plan
All media identified	Yes	Soil sampling media identified in the sampling and quality plan

5.3.2 Laboratory

Consideration	Accepted	Comment
Samples analysed	Yes	Undertaken in NATA accredited laboratory. Samples in the analysis batch contain analytes below the level of detection. It is considered unlikely that contamination has occurred as a result of transport and handling.

5.4 Precision

A quantitative measure of the variability (or reproduced of the data)

5.4.1 Field

Consideration	Accepted	Comment
SOP	Yes	Complied
Field duplicates	Yes	Collected

5.4.2 Laboratory

Consideration	Accepted	Comment
Laboratory duplicates	Yes	Frequency of 5%, results to be within +/-40% or discussion required
Field duplicates (intra and inter laboratory)	Yes	Frequency of 5%, results to be within +/-40% or discussion required. Outliers exist for one duplicate. Not expected to impact on conclusions.
Laboratory prepared volatile trip spikes	NA	Frequency of 5%, results to be within +/-40% or discussion required.

5.5 Accuracy

A quantitative measure of the closeness of the reported data to the true value

5.5.1 Field

Consideration	Accepted	Comment
SOP	Yes	Complied
Field blanks	No	Not collected

5.5.2 Laboratory

Consideration	Accepted	Comment
Method blanks	Yes	Frequency of 5%, <5 times the PQL, PQL may be adjusted
Matrix spikes	No	Frequency of 5%, results to be within +/-40% or discussion required, Recovery failed acceptance criteria due to matrix interference and sample heterogeneity.
Matrix duplicates	No	Frequency of 5%, results to be within +/-40% or discussion required, RPD failed acceptance criteria due to sample heterogeneity
Surrogate spikes	Yes	Frequency of 5%, results to be within +/-40% or discussion required
Laboratory control samples	Yes	Frequency of 5%, results to be within +/-40% or discussion required
Laboratory prepared spikes	Yes	Frequency of 5%, results to be within +/-40% or discussion required

No trip blanks, field spikes or sample rinsates were submitted for analysis. This is not considered to create significant uncertainty in the analysis results because of the following rationale:

- The fieldwork methods used for soil sampling were consistent throughout the project with all in situ samples collected from material which had not been subject to exposure.
- The fieldwork was completed within a short time period and consistent methods were used for soil sampling.
- Soil samples were placed in insulated cooled containers as quickly as possible, with the containers filled to minimize headspace. The sample containers were sealed immediately after the sample was collected and chilled in an esky containing ice.
- The samples were stored in a refrigerator and transported with ice bricks to ensure preservation during transport and storage.
- The samples were placed in single use jars using clean sampling tools and disposable gloves from material not in contact with other samples. This reduces the likelihood of cross contamination.
- Samples in the analysis batches contained analytes below the level of detection. It is considered unlikely that contamination has occurred as a result of transport and handling.

6. Conclusion

All media appropriate to the objectives of this investigation have been adequately analysed and no area of significant uncertainty exist. It is concluded the data is usable for the purposes of the investigation.

Appendix 3. Field sampling log

Client Wakefield Ashurst Developments Pty Ltd
 Contact Peter Morley
 Job number 13592
 Location *Golf Course Heights Estate*, Euchareena Road, Molong NSW
 Date 27 August 2021
 Investigator Leah Desborough
 Weather conditions Fine

Sample ID	Matrix	Date	Analysis required	Observations/comments
ER1C	Soil	27/8/2021	Arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), nickel (Ni), zinc (Zn)	Composite of 11, 12, 13, 14
ER2C	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn	Composite of 21, 22, 23, 24
ER3C	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn	Composite of 31, 32, 33, 34
ER4C	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn	Composite of 41, 42, 43, 44
ER5C	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn	Composite of 51, 52, 53, 54
ER6C	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn	Composite of 61, 62, 63, 64
ER7C	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn	Composite of 71, 72, 73, 74
ER8C	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn	Composite of 81, 82, 83, 84
ER9C	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn	Composite of 91, 92, 93, 94
ER10C	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn	Composite of 101, 102, 103, 104
ER11D	Soil	27/8/2021	Organochlorine pesticides (OCP)	
ER21D	Soil	27/8/2021	OCP	
ER31D	Soil	27/8/2021	OCP	
ER41D	Soil	27/8/2021	OCP	
ER51D	Soil	27/8/2021	OCP	
ER61D	Soil	27/8/2021	OCP	
ER71D	Soil	27/8/2021	OCP	
ER81D	Soil	27/8/2021	OCP	
ER91D	Soil	27/8/2021	OCP	
ER101D	Soil	27/8/2021	OCP	
HS1	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn, mercury (Hg), total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene, xylenes, naphthalene (BTEXN), polycyclic aromatic hydrocarbons (PAH)	
HS2	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH, BTEXN, PAH	
HS3	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH, BTEXN, PAH	
HS4	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH, BTEXN, PAH	
HS5	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH, BTEXN, PAH	
HS6	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH, BTEXN, PAH	
HS7	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH, BTEXN, PAH	
HS8	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH, BTEXN, PAH	
HS9	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH, BTEXN, PAH	
HS10	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH, BTEXN, PAH	
HS11	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH, BTEXN, PAH	
HS12	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH, BTEXN, PAH	
HS13	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH, BTEXN, PAH	
HS14	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH, BTEXN, PAH	
HS15	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH, BTEXN, PAH	
HAS	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg	
ERDA	Soil	27/8/2021	As, Cd, Cr, Cu, Pb, Ni, Zn	
13592-1	Cement sheet	27/8/2021	Asbestos	
13592-2	Cement sheet	27/8/2021	Asbestos	

Client	Wakefield Ashurst Developments Pty Ltd
Contact	Peter Morley
Job number	13592
Location	<i>Golf Course Heights Estate</i> , Euchareena Road, Molong NSW
Date	27 September 2021
Investigator	Leah Desborough
Weather conditions	Fine

[illegible]

Appendix 4. Soil analysis results – SGS report number SE223464, SE223464A and SE224091

CLIENT DETAILS

Contact Maisie Dickie
Client ENVIROWEST CONSULTING PTY LIMITED
Address PO BOX 8158
NSW 2800

Telephone 61 2 63614954
Facsimile (Not specified)
Email maisie@envirowest.net.au

Project **13592**
Order Number **13592**
Samples 37

LABORATORY DETAILS

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

Telephone +61 2 8594 0400
Facsimile +61 2 8594 0499
Email au.environmental.sydney@sgs.com

SGS Reference **SE223464 R0**
Date Received 10/9/2021
Date Reported 20/9/2021

COMMENTS

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

SIGNATORIES



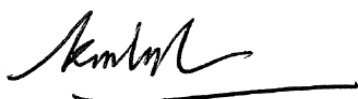
Akheeque BENIAAMEEN
Chemist



Bennet LO
Senior Chemist



Dong LIANG
Metals/Inorganics Team Leader



Ly Kim HA
Organic Section Head



Shane MCDERMOTT
Inorganic/Metals Chemist



Teresa NGUYEN
Organic Chemist

VOC's in Soil [AN433] Tested: 15/9/2021

PARAMETER	UOM	LOR	HS1	HS2	HS3	HS4	HS5
			SOIL	SOIL	SOIL	SOIL	SOIL
			27/8/21 16:30 SE223464.001	27/8/21 16:30 SE223464.002	27/8/21 16:30 SE223464.003	27/8/21 16:30 SE223464.004	27/8/21 16:30 SE223464.005
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	HS6	HS7	HS8	HS9	HS10
			SOIL	SOIL	SOIL	SOIL	SOIL
			27/8/21 16:30 SE223464.006	27/8/21 16:30 SE223464.007	27/8/21 16:30 SE223464.008	27/8/21 16:30 SE223464.009	27/8/21 16:30 SE223464.010
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	HS11	HS12	HS13	HS14	HS15
			SOIL	SOIL	SOIL	SOIL	SOIL
			27/8/21 16:30 SE223464.011	27/8/21 16:30 SE223464.012	27/8/21 16:30 SE223464.013	27/8/21 16:30 SE223464.014	27/8/21 16:30 SE223464.015
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 15/9/2021

PARAMETER	UOM	LOR	HS1	HS2	HS3	HS4	HS5
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			27/8/21 16:30 SE223464.001	27/8/21 16:30 SE223464.002	27/8/21 16:30 SE223464.003	27/8/21 16:30 SE223464.004	27/8/21 16:30 SE223464.005
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	HS6	HS7	HS8	HS9	HS10
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			27/8/21 16:30 SE223464.006	27/8/21 16:30 SE223464.007	27/8/21 16:30 SE223464.008	27/8/21 16:30 SE223464.009	27/8/21 16:30 SE223464.010
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	HS11	HS12	HS13	HS14	HS15
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			27/8/21 16:30 SE223464.011	27/8/21 16:30 SE223464.012	27/8/21 16:30 SE223464.013	27/8/21 16:30 SE223464.014	27/8/21 16:30 SE223464.015
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 14/9/2021

PARAMETER	UOM	LOR	HS1	HS2	HS3	HS4	HS5
			SOIL	SOIL	SOIL	SOIL	SOIL
			27/8/21 16:30 SE223464.001	27/8/21 16:30 SE223464.002	27/8/21 16:30 SE223464.003	27/8/21 16:30 SE223464.004	27/8/21 16:30 SE223464.005
TRH C10-C14	mg/kg	20	<20	41	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	29	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	29	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	HS6	HS7	HS8	HS9	HS10
			SOIL	SOIL	SOIL	SOIL	SOIL
			27/8/21 16:30 SE223464.006	27/8/21 16:30 SE223464.007	27/8/21 16:30 SE223464.008	27/8/21 16:30 SE223464.009	27/8/21 16:30 SE223464.010
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	HS11	HS12	HS13	HS14	HS15
			SOIL	SOIL	SOIL	SOIL	SOIL
			27/8/21 16:30 SE223464.011	27/8/21 16:30 SE223464.012	27/8/21 16:30 SE223464.013	27/8/21 16:30 SE223464.014	27/8/21 16:30 SE223464.015
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 14/9/2021

PARAMETER	UOM	LOR	HS1	HS2	HS3	HS4	HS5
			SOIL	SOIL	SOIL	SOIL	SOIL
			27/8/21 16:30 SE223464.001	27/8/21 16:30 SE223464.002	27/8/21 16:30 SE223464.003	27/8/21 16:30 SE223464.004	27/8/21 16:30 SE223464.005
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8

PARAMETER	UOM	LOR	HS6	HS7	HS8	HS9	HS10
			SOIL	SOIL	SOIL	SOIL	SOIL
			27/8/21 16:30 SE223464.006	27/8/21 16:30 SE223464.007	27/8/21 16:30 SE223464.008	27/8/21 16:30 SE223464.009	27/8/21 16:30 SE223464.010
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 14/9/2021 (continued)

PARAMETER	UOM	LOR	HS11	HS12	HS13	HS14	HS15
			SOIL - 27/8/21 16:30 SE223464.011	SOIL - 27/8/21 16:30 SE223464.012	SOIL - 27/8/21 16:30 SE223464.013	SOIL - 27/8/21 16:30 SE223464.014	SOIL - 27/8/21 16:30 SE223464.015
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8

OC Pesticides in Soil [AN420] Tested: 14/9/2021

PARAMETER	UOM	LOR	ER11D	ER21D	ER31D	ER41D	ER51D
			SOIL	SOIL	SOIL	SOIL	SOIL
			27/8/21 16:30 SE223464.026	27/8/21 16:30 SE223464.027	27/8/21 16:30 SE223464.028	27/8/21 16:30 SE223464.029	27/8/21 16:30 SE223464.030
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1	<1	<1

OC Pesticides in Soil [AN420] Tested: 14/9/2021 (continued)

PARAMETER	UOM	LOR	ER61D	ER71D	ER81D	ER91D	ER101D
			SOIL - 27/8/21 16:30 SE223464.031	SOIL - 27/8/21 16:30 SE223464.032	SOIL - 27/8/21 16:30 SE223464.033	SOIL - 27/8/21 16:30 SE223464.034	SOIL - 27/8/21 16:30 SE223464.035
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1	<1	<1

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 17/9/2021

PARAMETER	UOM	LOR	HS1	HS2	HS3	HS4	HS5
			SOIL	SOIL	SOIL	SOIL	SOIL
			27/8/21 16:30 SE223464.001	27/8/21 16:30 SE223464.002	27/8/21 16:30 SE223464.003	27/8/21 16:30 SE223464.004	27/8/21 16:30 SE223464.005
Arsenic, As	mg/kg	1	4	8	4	6	5
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	32	28	16	12	42
Copper, Cu	mg/kg	0.5	42	45	32	49	47
Lead, Pb	mg/kg	1	6	14	6	7	10
Nickel, Ni	mg/kg	0.5	13	8.0	5.7	6.5	16
Zinc, Zn	mg/kg	2	60	88	68	85	74

PARAMETER	UOM	LOR	HS6	HS7	HS8	HS9	HS10
			SOIL	SOIL	SOIL	SOIL	SOIL
			27/8/21 16:30 SE223464.006	27/8/21 16:30 SE223464.007	27/8/21 16:30 SE223464.008	27/8/21 16:30 SE223464.009	27/8/21 16:30 SE223464.010
Arsenic, As	mg/kg	1	5	5	4	7	4
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	31	26	23	49	28
Copper, Cu	mg/kg	0.5	39	31	25	46	59
Lead, Pb	mg/kg	1	8	6	8	16	13
Nickel, Ni	mg/kg	0.5	9.5	11	6.8	17	14
Zinc, Zn	mg/kg	2	130	46	47	120	170

PARAMETER	UOM	LOR	HS11	HS12	HS13	HS14	HS15
			SOIL	SOIL	SOIL	SOIL	SOIL
			27/8/21 16:30 SE223464.011	27/8/21 16:30 SE223464.012	27/8/21 16:30 SE223464.013	27/8/21 16:30 SE223464.014	27/8/21 16:30 SE223464.015
Arsenic, As	mg/kg	1	9	4	17	5	4
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	39	110	19	22	61
Copper, Cu	mg/kg	0.5	44	58	82	20	47
Lead, Pb	mg/kg	1	6	6	12	13	12
Nickel, Ni	mg/kg	0.5	13	35	9.8	9.3	31
Zinc, Zn	mg/kg	2	49	45	1900	69	65

PARAMETER	UOM	LOR	ER1C	ER2C	ER3C	ER4C	ER5C
			SOIL	SOIL	SOIL	SOIL	SOIL
			27/8/21 16:30 SE223464.016	27/8/21 16:30 SE223464.017	27/8/21 16:30 SE223464.018	27/8/21 16:30 SE223464.019	27/8/21 16:30 SE223464.020
Arsenic, As	mg/kg	1	5	4	5	4	4
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	46	54	37	33	36
Copper, Cu	mg/kg	0.5	38	33	36	42	34
Lead, Pb	mg/kg	1	17	7	5	9	12
Nickel, Ni	mg/kg	0.5	14	23	17	16	9.5
Zinc, Zn	mg/kg	2	230	72	57	97	50

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 17/9/2021 (continued)

PARAMETER	UOM	LOR	ER6C	ER7C	ER8C	ER9C	ER10C
			SOIL	SOIL	SOIL	SOIL	SOIL
			27/8/21 16:30 SE223464.021	27/8/21 16:30 SE223464.022	27/8/21 16:30 SE223464.023	27/8/21 16:30 SE223464.024	27/8/21 16:30 SE223464.025
Arsenic, As	mg/kg	1	4	6	4	5	6
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	16	35	56	27	38
Copper, Cu	mg/kg	0.5	37	34	45	43	28
Lead, Pb	mg/kg	1	6	5	5	6	14
Nickel, Ni	mg/kg	0.5	8.9	16	24	11	11
Zinc, Zn	mg/kg	2	69	56	64	54	39

PARAMETER	UOM	LOR	HAS	ERDA
			SOIL	SOIL
			27/8/21 16:30 SE223464.036	27/8/21 16:30 SE223464.037
Arsenic, As	mg/kg	1	7	7
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	21	44
Copper, Cu	mg/kg	0.5	35	38
Lead, Pb	mg/kg	1	7	5
Nickel, Ni	mg/kg	0.5	9.6	18
Zinc, Zn	mg/kg	2	43	60

Mercury in Soil [AN312] Tested: 17/9/2021

PARAMETER	UOM	LOR	HS1	HS2	HS3	HS4	HS5
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			27/8/21 16:30 SE223464.001	27/8/21 16:30 SE223464.002	27/8/21 16:30 SE223464.003	27/8/21 16:30 SE223464.004	27/8/21 16:30 SE223464.005
Mercury	mg/kg	0.05	<0.05	0.07	<0.05	<0.05	<0.05

PARAMETER	UOM	LOR	HS6	HS7	HS8	HS9	HS10
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			27/8/21 16:30 SE223464.006	27/8/21 16:30 SE223464.007	27/8/21 16:30 SE223464.008	27/8/21 16:30 SE223464.009	27/8/21 16:30 SE223464.010
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

PARAMETER	UOM	LOR	HS11	HS12	HS13	HS14	HS15
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			27/8/21 16:30 SE223464.011	27/8/21 16:30 SE223464.012	27/8/21 16:30 SE223464.013	27/8/21 16:30 SE223464.014	27/8/21 16:30 SE223464.015
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

PARAMETER	UOM	LOR	HAS
			SOIL
			-
			27/8/21 16:30 SE223464.036
Mercury	mg/kg	0.05	<0.05

Moisture Content [AN002] Tested: 15/9/2021

PARAMETER	UOM	LOR	HS1	HS2	HS3	HS4	HS5
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			27/8/21 16:30 SE223464.001	27/8/21 16:30 SE223464.002	27/8/21 16:30 SE223464.003	27/8/21 16:30 SE223464.004	27/8/21 16:30 SE223464.005
% Moisture	%w/w	1	17.7	30.8	16.6	29.0	27.4

PARAMETER	UOM	LOR	HS6	HS7	HS8	HS9	HS10
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			27/8/21 16:30 SE223464.006	27/8/21 16:30 SE223464.007	27/8/21 16:30 SE223464.008	27/8/21 16:30 SE223464.009	27/8/21 16:30 SE223464.010
% Moisture	%w/w	1	23.4	19.5	24.9	24.6	31.6

PARAMETER	UOM	LOR	HS11	HS12	HS13	HS14	HS15
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			27/8/21 16:30 SE223464.011	27/8/21 16:30 SE223464.012	27/8/21 16:30 SE223464.013	27/8/21 16:30 SE223464.014	27/8/21 16:30 SE223464.015
% Moisture	%w/w	1	26.2	22.6	27.2	17.9	16.2

PARAMETER	UOM	LOR	ER1C	ER2C	ER3C	ER4C	ER5C
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			27/8/21 16:30 SE223464.016	27/8/21 16:30 SE223464.017	27/8/21 16:30 SE223464.018	27/8/21 16:30 SE223464.019	27/8/21 16:30 SE223464.020
% Moisture	%w/w	1	28.0	27.7	28.0	42.4	22.7

PARAMETER	UOM	LOR	ER6C	ER7C	ER8C	ER9C	ER10C
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			27/8/21 16:30 SE223464.021	27/8/21 16:30 SE223464.022	27/8/21 16:30 SE223464.023	27/8/21 16:30 SE223464.024	27/8/21 16:30 SE223464.025
% Moisture	%w/w	1	25.2	32.3	29.9	25.6	33.0

PARAMETER	UOM	LOR	ER11D	ER21D	ER31D	ER41D	ER51D
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			27/8/21 16:30 SE223464.026	27/8/21 16:30 SE223464.027	27/8/21 16:30 SE223464.028	27/8/21 16:30 SE223464.029	27/8/21 16:30 SE223464.030
% Moisture	%w/w	1	35.3	25.2	35.8	29.1	27.2

PARAMETER	UOM	LOR	ER61D	ER71D	ER81D	ER91D	ER101D
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			27/8/21 16:30 SE223464.031	27/8/21 16:30 SE223464.032	27/8/21 16:30 SE223464.033	27/8/21 16:30 SE223464.034	27/8/21 16:30 SE223464.035
% Moisture	%w/w	1	25.8	35.2	22.4	17.8	30.2

Moisture Content [AN002] Tested: 15/9/2021 (continued)

			HAS	ERDA
			SOIL	SOIL
			-	-
			27/8/21 16:30	27/8/21 16:30
			SE223464.036	SE223464.037
PARAMETER	UOM	LOR		
% Moisture	%w/w	1	23.5	28.0

METHOD

METHODOLOGY SUMMARY

AN002

The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.

AN040/AN320

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

AN040

A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.

AN312

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

AN403

Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.

AN403

Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.

AN403

The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.

AN420

(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).

AN420

SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).

AN433

VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC's are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

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

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

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

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

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

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

Note that in terms of units of radioactivity:

- 1 Bq is equivalent to 27 pCi
- 37 MBq is equivalent to 1 mCi

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

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

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STATEMENT OF QA/QC PERFORMANCE

SE223464 R0

CLIENT DETAILS

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Project **13592**
Order Number **13592**
Samples 37

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SGS Reference **SE223464 R0**
Date Received 10 Sep 2021
Date Reported 20 Sep 2021

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.

This QA/QC Statement must be read in conjunction with the referenced Analytical Report.

The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Extraction Date	Moisture Content	37 items
	OC Pesticides in Soil	10 items
	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	15 items
	TRH (Total Recoverable Hydrocarbons) in Soil	15 items
	VOC's in Soil	15 items
	Volatile Petroleum Hydrocarbons in Soil	15 items
Analysis Date	VOC's in Soil	15 items
	Volatile Petroleum Hydrocarbons in Soil	31 items
Duplicate	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	1 item
Matrix Spike	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	2 items
	TRH (Total Recoverable Hydrocarbons) in Soil	2 items

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	37 Soil
Date documentation received	10/9/2021	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	15°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Mercury in Soil

Method: ME-(AU)-ENVJAN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HS1	SE223464.001	LB232939	27 Aug 2021	10 Sep 2021	24 Sep 2021	17 Sep 2021	24 Sep 2021	20 Sep 2021
HS2	SE223464.002	LB232939	27 Aug 2021	10 Sep 2021	24 Sep 2021	17 Sep 2021	24 Sep 2021	20 Sep 2021
HS3	SE223464.003	LB232939	27 Aug 2021	10 Sep 2021	24 Sep 2021	17 Sep 2021	24 Sep 2021	20 Sep 2021
HS4	SE223464.004	LB232939	27 Aug 2021	10 Sep 2021	24 Sep 2021	17 Sep 2021	24 Sep 2021	20 Sep 2021
HS5	SE223464.005	LB232939	27 Aug 2021	10 Sep 2021	24 Sep 2021	17 Sep 2021	24 Sep 2021	20 Sep 2021
HS6	SE223464.006	LB232939	27 Aug 2021	10 Sep 2021	24 Sep 2021	17 Sep 2021	24 Sep 2021	20 Sep 2021
HS7	SE223464.007	LB232939	27 Aug 2021	10 Sep 2021	24 Sep 2021	17 Sep 2021	24 Sep 2021	20 Sep 2021
HS8	SE223464.008	LB232939	27 Aug 2021	10 Sep 2021	24 Sep 2021	17 Sep 2021	24 Sep 2021	20 Sep 2021
HS9	SE223464.009	LB232939	27 Aug 2021	10 Sep 2021	24 Sep 2021	17 Sep 2021	24 Sep 2021	20 Sep 2021
HS10	SE223464.010	LB232939	27 Aug 2021	10 Sep 2021	24 Sep 2021	17 Sep 2021	24 Sep 2021	20 Sep 2021
HS11	SE223464.011	LB232939	27 Aug 2021	10 Sep 2021	24 Sep 2021	17 Sep 2021	24 Sep 2021	20 Sep 2021
HS12	SE223464.012	LB232939	27 Aug 2021	10 Sep 2021	24 Sep 2021	17 Sep 2021	24 Sep 2021	20 Sep 2021
HS13	SE223464.013	LB232939	27 Aug 2021	10 Sep 2021	24 Sep 2021	17 Sep 2021	24 Sep 2021	20 Sep 2021
HS14	SE223464.014	LB232939	27 Aug 2021	10 Sep 2021	24 Sep 2021	17 Sep 2021	24 Sep 2021	20 Sep 2021
HS15	SE223464.015	LB232939	27 Aug 2021	10 Sep 2021	24 Sep 2021	17 Sep 2021	24 Sep 2021	20 Sep 2021
HAS	SE223464.036	LB232943	27 Aug 2021	10 Sep 2021	24 Sep 2021	17 Sep 2021	24 Sep 2021	20 Sep 2021

Moisture Content

Method: ME-(AU)-ENVJAN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HS1	SE223464.001	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
HS2	SE223464.002	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
HS3	SE223464.003	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
HS4	SE223464.004	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
HS5	SE223464.005	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
HS6	SE223464.006	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
HS7	SE223464.007	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
HS8	SE223464.008	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
HS9	SE223464.009	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
HS10	SE223464.010	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
HS11	SE223464.011	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
HS12	SE223464.012	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
HS13	SE223464.013	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
HS14	SE223464.014	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
HS15	SE223464.015	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
ER1C	SE223464.016	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
ER2C	SE223464.017	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
ER3C	SE223464.018	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
ER4C	SE223464.019	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
ER5C	SE223464.020	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
ER6C	SE223464.021	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
ER7C	SE223464.022	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
ER8C	SE223464.023	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
ER9C	SE223464.024	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
ER10C	SE223464.025	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
ER11D	SE223464.026	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
ER21D	SE223464.027	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
ER31D	SE223464.028	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
ER41D	SE223464.029	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
ER51D	SE223464.030	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
ER61D	SE223464.031	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
ER71D	SE223464.032	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
ER81D	SE223464.033	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
ER91D	SE223464.034	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
ER101D	SE223464.035	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
HAS	SE223464.036	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021
ERDA	SE223464.037	LB232763	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	20 Sep 2021	20 Sep 2021

OC Pesticides in Soil

Method: ME-(AU)-ENVJAN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HS1	SE223464.001	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS2	SE223464.002	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

OC Pesticides in Soil (continued)

Method: ME-(AU)-ENVJAN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HS3	SE223464.003	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS4	SE223464.004	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS5	SE223464.005	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS6	SE223464.006	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS7	SE223464.007	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS8	SE223464.008	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS9	SE223464.009	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS10	SE223464.010	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS11	SE223464.011	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS12	SE223464.012	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS13	SE223464.013	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS14	SE223464.014	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS15	SE223464.015	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER11D	SE223464.026	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER21D	SE223464.027	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER31D	SE223464.028	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER41D	SE223464.029	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER51D	SE223464.030	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER61D	SE223464.031	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER71D	SE223464.032	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER81D	SE223464.033	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER91D	SE223464.034	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER101D	SE223464.035	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-ENVJAN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HS1	SE223464.001	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS2	SE223464.002	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS3	SE223464.003	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS4	SE223464.004	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS5	SE223464.005	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS6	SE223464.006	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS7	SE223464.007	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS8	SE223464.008	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS9	SE223464.009	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS10	SE223464.010	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS11	SE223464.011	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS12	SE223464.012	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS13	SE223464.013	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS14	SE223464.014	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS15	SE223464.015	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER11D	SE223464.026	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER21D	SE223464.027	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER31D	SE223464.028	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER41D	SE223464.029	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER51D	SE223464.030	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER61D	SE223464.031	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER71D	SE223464.032	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER81D	SE223464.033	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER91D	SE223464.034	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER101D	SE223464.035	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-ENVJAN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HS1	SE223464.001	LB232934	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
HS2	SE223464.002	LB232934	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
HS3	SE223464.003	LB232934	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
HS4	SE223464.004	LB232934	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
HS5	SE223464.005	LB232934	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
HS6	SE223464.006	LB232934	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
HS7	SE223464.007	LB232934	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES (continued)

Method: ME-(AU)-[ENV]AN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HS8	SE223464.008	LB232934	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
HS9	SE223464.009	LB232934	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
HS10	SE223464.010	LB232934	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
HS11	SE223464.011	LB232934	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
HS12	SE223464.012	LB232934	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
HS13	SE223464.013	LB232934	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
HS14	SE223464.014	LB232934	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
HS15	SE223464.015	LB232934	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
ER1C	SE223464.016	LB232936	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
ER2C	SE223464.017	LB232936	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
ER3C	SE223464.018	LB232936	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
ER4C	SE223464.019	LB232936	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
ER5C	SE223464.020	LB232936	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
ER6C	SE223464.021	LB232936	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
ER7C	SE223464.022	LB232936	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
ER8C	SE223464.023	LB232936	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
ER9C	SE223464.024	LB232936	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
ER10C	SE223464.025	LB232936	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
HAS	SE223464.036	LB232936	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021
ERDA	SE223464.037	LB232936	27 Aug 2021	10 Sep 2021	23 Feb 2022	17 Sep 2021	23 Feb 2022	20 Sep 2021

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HS1	SE223464.001	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS2	SE223464.002	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS3	SE223464.003	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS4	SE223464.004	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS5	SE223464.005	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS6	SE223464.006	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS7	SE223464.007	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS8	SE223464.008	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS9	SE223464.009	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS10	SE223464.010	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS11	SE223464.011	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS12	SE223464.012	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS13	SE223464.013	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS14	SE223464.014	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
HS15	SE223464.015	LB232658	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER11D	SE223464.026	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER21D	SE223464.027	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER31D	SE223464.028	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER41D	SE223464.029	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER51D	SE223464.030	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER61D	SE223464.031	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER71D	SE223464.032	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER81D	SE223464.033	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER91D	SE223464.034	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021
ER101D	SE223464.035	LB232670	27 Aug 2021	10 Sep 2021	10 Sep 2021	14 Sep 2021†	24 Oct 2021	20 Sep 2021

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HS1	SE223464.001	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS2	SE223464.002	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS3	SE223464.003	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS4	SE223464.004	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS5	SE223464.005	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS6	SE223464.006	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS7	SE223464.007	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS8	SE223464.008	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS9	SE223464.009	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS10	SE223464.010	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

VOC's in Soil (continued)

Method: ME-(AU)-ENVJAN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HS11	SE223464.011	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS12	SE223464.012	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS13	SE223464.013	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS14	SE223464.014	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS15	SE223464.015	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-ENVJAN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HS1	SE223464.001	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS2	SE223464.002	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS3	SE223464.003	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS4	SE223464.004	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS5	SE223464.005	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS6	SE223464.006	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS7	SE223464.007	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS8	SE223464.008	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS9	SE223464.009	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS10	SE223464.010	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS11	SE223464.011	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS12	SE223464.012	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS13	SE223464.013	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS14	SE223464.014	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†
HS15	SE223464.015	LB232757	27 Aug 2021	10 Sep 2021	10 Sep 2021	15 Sep 2021†	10 Sep 2021	20 Sep 2021†

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	ER11D	SE223464.026	%	60 - 130%	115
	ER21D	SE223464.027	%	60 - 130%	112
	ER31D	SE223464.028	%	60 - 130%	115
	ER41D	SE223464.029	%	60 - 130%	117
	ER51D	SE223464.030	%	60 - 130%	121
	ER61D	SE223464.031	%	60 - 130%	109
	ER71D	SE223464.032	%	60 - 130%	113
	ER81D	SE223464.033	%	60 - 130%	117
	ER91D	SE223464.034	%	60 - 130%	112
	ER101D	SE223464.035	%	60 - 130%	113

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	HS1	SE223464.001	%	70 - 130%	74
	HS2	SE223464.002	%	70 - 130%	78
	HS3	SE223464.003	%	70 - 130%	75
	HS4	SE223464.004	%	70 - 130%	74
	HS5	SE223464.005	%	70 - 130%	75
	HS6	SE223464.006	%	70 - 130%	81
	HS7	SE223464.007	%	70 - 130%	77
	HS8	SE223464.008	%	70 - 130%	78
	HS9	SE223464.009	%	70 - 130%	75
	HS10	SE223464.010	%	70 - 130%	76
	HS11	SE223464.011	%	70 - 130%	77
	HS12	SE223464.012	%	70 - 130%	74
	HS13	SE223464.013	%	70 - 130%	74
	HS14	SE223464.014	%	70 - 130%	76
	HS15	SE223464.015	%	70 - 130%	73
d14-p-terphenyl (Surrogate)	HS1	SE223464.001	%	70 - 130%	88
	HS2	SE223464.002	%	70 - 130%	92
	HS3	SE223464.003	%	70 - 130%	88
	HS4	SE223464.004	%	70 - 130%	86
	HS5	SE223464.005	%	70 - 130%	89
	HS6	SE223464.006	%	70 - 130%	96
	HS7	SE223464.007	%	70 - 130%	89
	HS8	SE223464.008	%	70 - 130%	91
	HS9	SE223464.009	%	70 - 130%	88
	HS10	SE223464.010	%	70 - 130%	87
	HS11	SE223464.011	%	70 - 130%	89
	HS12	SE223464.012	%	70 - 130%	91
	HS13	SE223464.013	%	70 - 130%	85
	HS14	SE223464.014	%	70 - 130%	93
	HS15	SE223464.015	%	70 - 130%	92
d5-nitrobenzene (Surrogate)	HS1	SE223464.001	%	70 - 130%	73
	HS2	SE223464.002	%	70 - 130%	79
	HS3	SE223464.003	%	70 - 130%	78
	HS4	SE223464.004	%	70 - 130%	76
	HS5	SE223464.005	%	70 - 130%	77
	HS6	SE223464.006	%	70 - 130%	83
	HS7	SE223464.007	%	70 - 130%	75
	HS8	SE223464.008	%	70 - 130%	76
	HS9	SE223464.009	%	70 - 130%	77
	HS10	SE223464.010	%	70 - 130%	75
	HS11	SE223464.011	%	70 - 130%	77
	HS12	SE223464.012	%	70 - 130%	78
	HS13	SE223464.013	%	70 - 130%	75
	HS14	SE223464.014	%	70 - 130%	78
	HS15	SE223464.015	%	70 - 130%	73

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units
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Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	HS1	SE223464.001	%	60 - 130%	87
	HS2	SE223464.002	%	60 - 130%	83
	HS3	SE223464.003	%	60 - 130%	83
	HS4	SE223464.004	%	60 - 130%	85
	HS5	SE223464.005	%	60 - 130%	85
	HS6	SE223464.006	%	60 - 130%	87
	HS7	SE223464.007	%	60 - 130%	68
	HS8	SE223464.008	%	60 - 130%	79
	HS9	SE223464.009	%	60 - 130%	83
	HS10	SE223464.010	%	60 - 130%	79
	HS11	SE223464.011	%	60 - 130%	83
	HS12	SE223464.012	%	60 - 130%	79
	HS13	SE223464.013	%	60 - 130%	69
	HS14	SE223464.014	%	60 - 130%	83
	HS15	SE223464.015	%	60 - 130%	87
d4-1,2-dichloroethane (Surrogate)	HS1	SE223464.001	%	60 - 130%	103
	HS2	SE223464.002	%	60 - 130%	101
	HS3	SE223464.003	%	60 - 130%	99
	HS4	SE223464.004	%	60 - 130%	102
	HS5	SE223464.005	%	60 - 130%	100
	HS6	SE223464.006	%	60 - 130%	101
	HS7	SE223464.007	%	60 - 130%	83
	HS8	SE223464.008	%	60 - 130%	95
	HS9	SE223464.009	%	60 - 130%	100
	HS10	SE223464.010	%	60 - 130%	95
	HS11	SE223464.011	%	60 - 130%	98
	HS12	SE223464.012	%	60 - 130%	94
	HS13	SE223464.013	%	60 - 130%	94
	HS14	SE223464.014	%	60 - 130%	102
	HS15	SE223464.015	%	60 - 130%	103
d8-toluene (Surrogate)	HS1	SE223464.001	%	60 - 130%	103
	HS2	SE223464.002	%	60 - 130%	98
	HS3	SE223464.003	%	60 - 130%	98
	HS4	SE223464.004	%	60 - 130%	101
	HS5	SE223464.005	%	60 - 130%	99
	HS6	SE223464.006	%	60 - 130%	101
	HS7	SE223464.007	%	60 - 130%	82
	HS8	SE223464.008	%	60 - 130%	93
	HS9	SE223464.009	%	60 - 130%	99
	HS10	SE223464.010	%	60 - 130%	95
	HS11	SE223464.011	%	60 - 130%	97
	HS12	SE223464.012	%	60 - 130%	94
	HS13	SE223464.013	%	60 - 130%	90
	HS14	SE223464.014	%	60 - 130%	102
	HS15	SE223464.015	%	60 - 130%	103

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	HS1	SE223464.001	%	60 - 130%	87
	HS2	SE223464.002	%	60 - 130%	83
	HS3	SE223464.003	%	60 - 130%	83
	HS4	SE223464.004	%	60 - 130%	85
	HS5	SE223464.005	%	60 - 130%	85
	HS6	SE223464.006	%	60 - 130%	87
	HS7	SE223464.007	%	60 - 130%	68
	HS8	SE223464.008	%	60 - 130%	79
	HS9	SE223464.009	%	60 - 130%	83
	HS10	SE223464.010	%	60 - 130%	79
	HS11	SE223464.011	%	60 - 130%	83
	HS12	SE223464.012	%	60 - 130%	79
	HS13	SE223464.013	%	60 - 130%	69

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Volatile Petroleum Hydrocarbons in Soil (continued)

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	HS14	SE223464.014	%	60 - 130%	83
	HS15	SE223464.015	%	60 - 130%	87
d4-1,2-dichloroethane (Surrogate)	HS1	SE223464.001	%	60 - 130%	103
	HS2	SE223464.002	%	60 - 130%	101
	HS3	SE223464.003	%	60 - 130%	99
	HS4	SE223464.004	%	60 - 130%	102
	HS5	SE223464.005	%	60 - 130%	100
	HS6	SE223464.006	%	60 - 130%	101
	HS7	SE223464.007	%	60 - 130%	83
	HS8	SE223464.008	%	60 - 130%	95
	HS9	SE223464.009	%	60 - 130%	100
	HS10	SE223464.010	%	60 - 130%	95
	HS11	SE223464.011	%	60 - 130%	98
	HS12	SE223464.012	%	60 - 130%	94
	HS13	SE223464.013	%	60 - 130%	94
	HS14	SE223464.014	%	60 - 130%	102
	HS15	SE223464.015	%	60 - 130%	103
d8-toluene (Surrogate)	HS1	SE223464.001	%	60 - 130%	103
	HS2	SE223464.002	%	60 - 130%	98
	HS3	SE223464.003	%	60 - 130%	98
	HS4	SE223464.004	%	60 - 130%	101
	HS5	SE223464.005	%	60 - 130%	99
	HS6	SE223464.006	%	60 - 130%	101
	HS7	SE223464.007	%	60 - 130%	82
	HS8	SE223464.008	%	60 - 130%	93
	HS9	SE223464.009	%	60 - 130%	99
	HS10	SE223464.010	%	60 - 130%	95
	HS11	SE223464.011	%	60 - 130%	97
	HS12	SE223464.012	%	60 - 130%	94
	HS13	SE223464.013	%	60 - 130%	90
	HS14	SE223464.014	%	60 - 130%	102
	HS15	SE223464.015	%	60 - 130%	103

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result
LB232939.001	Mercury	mg/kg	0.05	<0.05
LB232943.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB232670.001	Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
	Alpha BHC	mg/kg	0.1	<0.1
	Lindane	mg/kg	0.1	<0.1
	Heptachlor	mg/kg	0.1	<0.1
	Aldrin	mg/kg	0.1	<0.1
	Beta BHC	mg/kg	0.1	<0.1
	Delta BHC	mg/kg	0.1	<0.1
	Heptachlor epoxide	mg/kg	0.1	<0.1
	Alpha Endosulfan	mg/kg	0.2	<0.2
	Gamma Chlordane	mg/kg	0.1	<0.1
	Alpha Chlordane	mg/kg	0.1	<0.1
	p,p'-DDE	mg/kg	0.1	<0.1
	Dieldrin	mg/kg	0.2	<0.2
	Endrin	mg/kg	0.2	<0.2
	Beta Endosulfan	mg/kg	0.2	<0.2
	p,p'-DDD	mg/kg	0.1	<0.1
	p,p'-DDT	mg/kg	0.1	<0.1
	Endosulfan sulphate	mg/kg	0.1	<0.1
	Endrin Aldehyde	mg/kg	0.1	<0.1
	Methoxychlor	mg/kg	0.1	<0.1
	Endrin Ketone	mg/kg	0.1	<0.1
	Isodrin	mg/kg	0.1	<0.1
	Mirex	mg/kg	0.1	<0.1
Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	89

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB232658.001	Naphthalene	mg/kg	0.1	<0.1
	2-methylnaphthalene	mg/kg	0.1	<0.1
	1-methylnaphthalene	mg/kg	0.1	<0.1
	Acenaphthylene	mg/kg	0.1	<0.1
	Acenaphthene	mg/kg	0.1	<0.1
	Fluorene	mg/kg	0.1	<0.1
	Phenanthrene	mg/kg	0.1	<0.1
	Anthracene	mg/kg	0.1	<0.1
	Fluoranthene	mg/kg	0.1	<0.1
	Pyrene	mg/kg	0.1	<0.1
	Benzo(a)anthracene	mg/kg	0.1	<0.1
	Chrysene	mg/kg	0.1	<0.1
	Benzo(a)pyrene	mg/kg	0.1	<0.1
	Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
	Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
	Benzo(ghi)perylene	mg/kg	0.1	<0.1
	Total PAH (18)	mg/kg	0.8	<0.8
Surrogates	d5-nitrobenzene (Surrogate)	%	-	102
	2-fluorobiphenyl (Surrogate)	%	-	94
	d14-p-terphenyl (Surrogate)	%	-	112

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result
LB232934.001	Arsenic, As	mg/kg	1	<1
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.5	<0.5
	Copper, Cu	mg/kg	0.5	<0.5
	Nickel, Ni	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES (continued)

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result
LB232934.001	Zinc, Zn	mg/kg	2	<2.0
LB232936.001	Arsenic, As	mg/kg	1	<1
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.5	<0.5
	Copper, Cu	mg/kg	0.5	<0.5
	Nickel, Ni	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1
	Zinc, Zn	mg/kg	2	<2.0

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB232658.001	TRH C10-C14	mg/kg	20	<20
	TRH C15-C28	mg/kg	45	<45
	TRH C29-C36	mg/kg	45	<45
	TRH C37-C40	mg/kg	100	<100
	TRH C10-C36 Total	mg/kg	110	<110

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB232757.001	Monocyclic Aromatic Hydrocarbons	Benzene	mg/kg	0.1	<0.1
		Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	110
		d8-toluene (Surrogate)	%	-	107
		Bromofluorobenzene (Surrogate)	%	-	106
	Totals	Total BTEX	mg/kg	0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number	Parameter	Units	LOR	Result
LB232757.001	TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = |OriginalResult - ReplicateResult| \times 100 / Mean$

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times SDL / Mean + LR$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Mercury in Soil

Method: ME-(AU)-ENVJAN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE223464.006	LB232939.014	Mercury	mg/kg	0.05	<0.05	<0.05	200	0
SE223464.015	LB232939.024	Mercury	mg/kg	0.05	<0.05	<0.05	200	0
SE223505A.006	LB232943.011	Mercury	mg/kg	0.05	<0.05	<0.05	200	0

Moisture Content

Method: ME-(AU)-ENVJAN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE223464.006	LB232763.011	% Moisture	%w/w	1	23.4	22.9	34	2
SE223464.016	LB232763.022	% Moisture	%w/w	1	28.0	27.2	34	3
SE223464.026	LB232763.033	% Moisture	%w/w	1	35.3	34.7	33	2
SE223464.036	LB232763.044	% Moisture	%w/w	1	23.5	26.4	34	12
SE223464.037	LB232763.046	% Moisture	%w/w	1	28.0	33.9	33	19

OC Pesticides in Soil

Method: ME-(AU)-ENVJAN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE223464.035	LB232670.014	Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
		Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
		Lindane	mg/kg	0.1	<0.1	<0.1	200	0
		Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
		Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
		Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
		Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
		Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
		o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
		Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
		Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
		Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
		trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
		p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
		Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
		Endrin	mg/kg	0.2	<0.2	<0.2	200	0
		o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
		o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
		Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
		p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
		p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
		Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
		Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
		Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
		Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
		Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
		Mirex	mg/kg	0.1	<0.1	<0.1	200	0
		Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.17	0.17	30

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-ENVJAN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE223464.006	LB232658.014	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
		Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
		Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
		Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = |OriginalResult - ReplicateResult| \times 100 / Mean$

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times SDL / Mean + LR$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE223464.006	LB232658.014	Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
		Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	<0.2	<0.2	200	0
		Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	<0.3	<0.3	134	0
		Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	<0.2	<0.2	175	0
		Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates						
		d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.4	30	7
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	7
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.4	30	8
SE223464.015	LB232658.024	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
		Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
		Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
		Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
		Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	<0.2	<0.2	200	0
		Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	<0.3	<0.3	134	0
		Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	<0.2	<0.2	175	0
		Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates						
		d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.4	30	11
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	8
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.4	30	3

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE223464.006	LB232934.014	Arsenic, As	mg/kg	1	5	5	49	10
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	31	31	32	1
		Copper, Cu	mg/kg	0.5	39	38	31	3
		Nickel, Ni	mg/kg	0.5	9.5	9.4	35	1
		Lead, Pb	mg/kg	1	8	8	42	7
		Zinc, Zn	mg/kg	2	130	120	32	6
SE223464.015	LB232934.024	Arsenic, As	mg/kg	1	4	3	58	7
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	61	65	31	6
		Copper, Cu	mg/kg	0.5	47	45	31	5
		Nickel, Ni	mg/kg	0.5	31	32	32	2
		Lead, Pb	mg/kg	1	12	10	39	14
		Zinc, Zn	mg/kg	2	65	61	33	7
SE223464.025	LB232936.014	Arsenic, As	mg/kg	1	6	5	48	4
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	38	37	31	4
		Copper, Cu	mg/kg	0.5	28	30	32	5
		Nickel, Ni	mg/kg	0.5	11	11	35	6
		Lead, Pb	mg/kg	1	14	13	37	10
		Zinc, Zn	mg/kg	2	39	46	35	16
SE223505A.006	LB232936.023	Arsenic, As	mg/kg	1	2	3	67	38
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	8.0	8.1	36	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES (continued)

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE223505A.006	LB232936.023	Copper, Cu	mg/kg	0.5	4.5	3.6	42	22
		Nickel, Ni	mg/kg	0.5	2.0	2.6	52	24
		Lead, Pb	mg/kg	1	9	13	39	33
		Zinc, Zn	mg/kg	2	74	150	32	68 @

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE223464.006	LB232658.014	TRH C10-C14	mg/kg	20	<20	<20	200	0
		TRH C15-C28	mg/kg	45	<45	<45	200	0
		TRH C29-C36	mg/kg	45	<45	<45	200	0
		TRH C37-C40	mg/kg	100	<100	<100	200	0
		TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
		TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands						
		TRH >C10-C16	mg/kg	25	<25	<25	200	0
		TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
		TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
		TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0
SE223464.015	LB232658.024	TRH C10-C14	mg/kg	20	<20	<20	200	0
		TRH C15-C28	mg/kg	45	<45	<45	200	0
		TRH C29-C36	mg/kg	45	<45	<45	200	0
		TRH C37-C40	mg/kg	100	<100	<100	200	0
		TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
		TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands						
		TRH >C10-C16	mg/kg	25	<25	<25	200	0
		TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
		TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
		TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE223464.006	LB232757.014	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
			Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.1	10.3	50	2
			d8-toluene (Surrogate)	mg/kg	-	10.1	10.3	50	3
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.7	8.6	50	1
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0
SE223464.015	LB232757.024	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
			Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.3	10.4	50	1
			d8-toluene (Surrogate)	mg/kg	-	10.3	10.4	50	0
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.7	8.7	50	0
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE223464.006	LB232757.014	TRH C6-C10	mg/kg	25	<25	<25	200	0
		TRH C6-C9	mg/kg	20	<20	<20	200	0
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.1	10.3	30	2
		d8-toluene (Surrogate)	mg/kg	-	10.1	10.3	30	3
		Bromofluorobenzene (Surrogate)	mg/kg	-	8.7	8.6	30	1
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200
	TRH C6-C10 minus BTEX (F1)		mg/kg	25	<25	<25	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Volatile Petroleum Hydrocarbons in Soil (continued)

Method: ME-(AU)-ENVJAN433

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE223464.015	LB232757.024	TRH C6-C10	mg/kg	25	<25	<25	200	0
		TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates						
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.3	10.4	30	1
		d8-toluene (Surrogate)	mg/kg	-	10.3	10.4	30	0
		Bromofluorobenzene (Surrogate)	mg/kg	-	8.7	8.7	30	0
		VPH F Bands						
		Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
		TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB232939.002	Mercury	mg/kg	0.05	0.22	0.2	70 - 130	112
LB232943.002	Mercury	mg/kg	0.05	0.23	0.2	70 - 130	114

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB232670.002	Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	103
	Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	99
	Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	104
	Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	102
	Endrin	mg/kg	0.2	0.2	0.2	60 - 140	117
	p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	108
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.15	40 - 130

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB232658.002	Naphthalene	mg/kg	0.1	3.2	4	60 - 140	81	
	Acenaphthylene	mg/kg	0.1	3.2	4	60 - 140	81	
	Acenaphthene	mg/kg	0.1	3.4	4	60 - 140	85	
	Phenanthrene	mg/kg	0.1	3.4	4	60 - 140	84	
	Anthracene	mg/kg	0.1	3.3	4	60 - 140	83	
	Fluoranthene	mg/kg	0.1	3.3	4	60 - 140	83	
	Pyrene	mg/kg	0.1	3.5	4	60 - 140	87	
	Benzo(a)pyrene	mg/kg	0.1	3.6	4	60 - 140	90	
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	82
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	78
d14-p-terphenyl (Surrogate)		mg/kg	-	0.4	0.5	40 - 130	88	

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN400/AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB232934.002	Arsenic, As	mg/kg	1	360	318.22	80 - 120	114
	Cadmium, Cd	mg/kg	0.3	3.9	4.81	70 - 130	80
	Chromium, Cr	mg/kg	0.5	39	38.31	80 - 120	102
	Copper, Cu	mg/kg	0.5	320	290	80 - 120	111
	Nickel, Ni	mg/kg	0.5	200	187	80 - 120	107
	Lead, Pb	mg/kg	1	100	89.9	80 - 120	111
	Zinc, Zn	mg/kg	2	290	273	80 - 120	107
LB232936.002	Arsenic, As	mg/kg	1	350	318.22	80 - 120	109
	Cadmium, Cd	mg/kg	0.3	4.2	4.81	70 - 130	88
	Chromium, Cr	mg/kg	0.5	36	38.31	80 - 120	95
	Copper, Cu	mg/kg	0.5	310	290	80 - 120	108
	Nickel, Ni	mg/kg	0.5	190	187	80 - 120	104
	Lead, Pb	mg/kg	1	97	89.9	80 - 120	108
	Zinc, Zn	mg/kg	2	280	273	80 - 120	104

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB232658.002	TRH C10-C14	mg/kg	20	42	40	60 - 140	105	
	TRH C15-C28	mg/kg	45	<45	40	60 - 140	103	
	TRH C29-C36	mg/kg	45	<45	40	60 - 140	78	
	TRH F Bands	TRH >C10-C16	mg/kg	25	41	40	60 - 140	103
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	95
		TRH >C34-C40 (F4)	mg/ka	120	<120	20	60 - 140	75

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB232757.002	Monocyclic	Benzene	mg/kg	0.1	4.6	5	60 - 140	92
	Aromatic	Toluene	mg/kg	0.1	4.6	5	60 - 140	93
		Ethylbenzene	mg/kg	0.1	5.1	5	60 - 140	101
		m/p-xylene	mg/kg	0.2	9.9	10	60 - 140	99
		o-xylene	mg/kg	0.1	5.0	5	60 - 140	99
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	11.8	10	70 - 130	118
		d8-toluene (Surrogate)	mg/kg	-	11.3	10	70 - 130	113

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB232757.002	Surrogates	Bromofluorobenzene (Surrogate)	mg/kg	-	10.4	10	70 - 130	104

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB232757.002	TRH C6-C10	mg/kg	25	92	92.5	60 - 140	100	
	TRH C6-C9	mg/kg	20	79	80	60 - 140	99	
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	11.8	10	70 - 130	118
		Bromofluorobenzene (Surrogate)	mg/kg	-	10.4	10	70 - 130	104
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	ma/ka	25	63	62.5	60 - 140	101

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub-sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE223463.001	LB232939.004	Mercury	mg/kg	0.05	0.25	<0.05	0.2	118
SE223464.036	LB232943.004	Mercury	mg/kg	0.05	0.24	<0.05	0.2	109

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE223464.026	LB232670.004	Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	-	-
		Alpha BHC	mg/kg	0.1	<0.1	<0.1	-	-
		Lindane	mg/kg	0.1	<0.1	<0.1	-	-
		Heptachlor	mg/kg	0.1	0.3	<0.1	0.2	122
		Aldrin	mg/kg	0.1	0.2	<0.1	0.2	109
		Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
		Delta BHC	mg/kg	0.1	0.2	<0.1	0.2	123
		Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	-	-
		o,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
		Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
		Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
		Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
		trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	-	-
		p,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
		Dieldrin	mg/kg	0.2	0.2	<0.2	0.2	115
		Endrin	mg/kg	0.2	0.2	<0.2	0.2	106
		o,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
		o,p'-DDT	mg/kg	0.1	<0.1	<0.1	-	-
		Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
		p,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
		p,p'-DDT	mg/kg	0.1	0.2	<0.1	0.2	109
		Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	-	-
		Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	-	-
		Methoxychlor	mg/kg	0.1	<0.1	<0.1	-	-
		Endrin Ketone	mg/kg	0.1	<0.1	<0.1	-	-
		Isodrin	mg/kg	0.1	<0.1	<0.1	-	-
		Mirex	mg/kg	0.1	<0.1	<0.1	-	-
		Total CLP OC Pesticides	mg/kg	1	2	<1	-	-
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.18	0.17	-	119

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE223463.001	LB232658.004	Naphthalene	mg/kg	0.1	3.0	<0.1	4	76
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Acenaphthylene	mg/kg	0.1	3.0	<0.1	4	75
		Acenaphthene	mg/kg	0.1	3.2	<0.1	4	80
		Fluorene	mg/kg	0.1	<0.1	<0.1	-	-
		Phenanthrene	mg/kg	0.1	3.1	<0.1	4	77
		Anthracene	mg/kg	0.1	3.1	<0.1	4	78
		Fluoranthene	mg/kg	0.1	3.1	<0.1	4	78
		Pyrene	mg/kg	0.1	3.3	<0.1	4	83
		Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
		Chrysene	mg/kg	0.1	<0.1	<0.1	-	-
		Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
		Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
		Benzo(a)pyrene	mg/kg	0.1	3.4	<0.1	4	86
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	-	-
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
		Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	-	-
		Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	3.4	<0.2	-	-
		Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	3.6	<0.3	-	-
		Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	3.5	<0.2	-	-
		Total PAH (18)	mg/kg	0.8	25	<0.8	-	-
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.4	-	77

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub-sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE223463.001	LB232658.004	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	71
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	82

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE223463.001	LB232934.004	Arsenic, As	mg/kg	1	47	3	50	88
		Cadmium, Cd	mg/kg	0.3	42	<0.3	50	85
		Chromium, Cr	mg/kg	0.5	55	14	50	82
		Copper, Cu	mg/kg	0.5	50	4.8	50	90
		Nickel, Ni	mg/kg	0.5	52	8.6	50	87
		Lead, Pb	mg/kg	1	48	6	50	84
		Zinc, Zn	mg/kg	2	76	36	50	81
SE223464.016	LB232936.004	Arsenic, As	mg/kg	1	51	5	50	93
		Cadmium, Cd	mg/kg	0.3	44	<0.3	50	88
		Chromium, Cr	mg/kg	0.5	79	46	50	66 ①
		Copper, Cu	mg/kg	0.5	76	38	50	76
		Nickel, Ni	mg/kg	0.5	57	14	50	86
		Lead, Pb	mg/kg	1	57	17	50	82
		Zinc, Zn	mg/kg	2	230	230	50	2 ②

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE223463.001	LB232658.004	TRH C10-C14	mg/kg	20	40	<20	40	100
		TRH C15-C28	mg/kg	45	77	<45	40	148 ①
		TRH C29-C36	mg/kg	45	<45	<45	40	93
		TRH C37-C40	mg/kg	100	<100	<100	-	-
		TRH C10-C36 Total	mg/kg	110	120	<110	-	-
		TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	-	-
		TRH >C10-C16	mg/kg	25	39	<25	40	98
		TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	39	<25	-	-
		TRH >C16-C34 (F3)	mg/kg	90	<90	<90	40	143 ①
		TRH >C34-C40 (F4)	mg/kg	120	<120	<120	-	-

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE223463.001	LB232757.004	Monocyclic	Benzene	mg/kg	0.1	4.2	<0.1	5	84
			Aromatic	Toluene	mg/kg	0.1	4.3	<0.1	5
			Ethylbenzene	mg/kg	0.1	4.7	<0.1	5	94
			m/p-xylene	mg/kg	0.2	9.5	<0.2	10	95
			o-xylene	mg/kg	0.1	4.8	<0.1	5	95
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.6	9.6	10	96
			d8-toluene (Surrogate)	mg/kg	-	9.4	9.1	10	94
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.9	8.8	10	89
		Totals	Total Xylenes	mg/kg	0.3	14	<0.3	-	-
	Total BTEX	mg/kg	0.6	27	<0.6	-	-		

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE223463.001	LB232757.004	TRH C6-C10	mg/kg	25	82	<25	92.5	88
		TRH C6-C9	mg/kg	20	70	<20	80	87
		Surrogates						
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.6	9.6	10	96
		d8-toluene (Surrogate)	mg/kg	-	9.4	9.1	10	94
		Bromofluorobenzene (Surrogate)	mg/kg	-	8.9	8.8	-	89
		VPH F						
		Benzene (F0)	mg/kg	0.1	4.2	<0.1	-	-
Bands		TRH C6-C10 minus BTEX (F1)	mg/kg	25	55	<25	62.5	87

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

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

- * NATA accreditation does not cover the performance of this service.
- ** Indicative data, theoretical holding time exceeded.
- *** Indicates that both * and ** apply.
- Sample not analysed for this analyte.
- IS Insufficient sample for analysis.
- LNR Sample listed, but not received.
- LOR Limit of reporting.
- QFH QC result is above the upper tolerance.
- QFL QC result is below the lower tolerance.
- ① At least 2 of 3 surrogates are within acceptance criteria.
- ② RPD failed acceptance criteria due to sample heterogeneity.
- ③ Results less than 5 times LOR preclude acceptance criteria for RPD.
- ④ Recovery failed acceptance criteria due to matrix interference.
- ⑤ Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
- ⑥ LOR was raised due to sample matrix interference.
- ⑦ LOR was raised due to dilution of significantly high concentration of analyte in sample.
- ⑧ Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
- ⑨ Recovery failed acceptance criteria due to sample heterogeneity.
- ⑩ LOR was raised due to high conductivity of the sample (required dilution).
- † Refer to relevant report comments for further information.

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Chain of Custody Form – Ref 13592

Sheet 1 of 3

Ref: 13592 Investigator: Envirowest Consulting 9 Cameron Place PO Box 8158 ORANGE NSW 2800 (02) 6361 4954 Email: maisie@envirowest.net.au Contact Person: Maisie Dickie Invoice: accounts@envirowest.net.au		Sample matrix Water Soil Sludge Cool HNO3/HCl Unpre-served		Sample preservation			Analysis CL10 CL1T OCP			
Laboratory: SGS SYDNEY 16/33 Maddox Street ALEXANDRIA NSW 2015 Quotation #: Envir_70119_2019 Courier/CN: Toll										
Sample ID	Container*	Sampling Date/Time								
HS1	A	27/08/2021	X							
HS2	A	27/08/2021	X							
HS3	A	27/08/2021	X							
HS4	A	27/08/2021	X							
HS5	A	27/08/2021	X							
HS6	A	27/08/2021	X							
HS7	A	27/08/2021	X							
HS8	A	27/08/2021	X							
HS9	A	27/08/2021	X							
HS10	A	27/08/2021	X							
HS11	A	27/08/2021	X							
HS12	A	27/08/2021	X							
HS13	A	27/08/2021	X							
HS14	A	27/08/2021	X							
HS15	A	27/08/2021	X							
ER1C	A	27/08/2021	X							
ER2C	A	27/08/2021	X							
Investigator: I attest that the proper field sampling procedures were used during the collection of these samples.			Sampler name: Maisie Dickie Date: 27/08/2021 Time: 1630							
Relinquished by: (print and signature)			Date 30/08/2021		Time 14:00		Received by: (print and signature)		Date 10-9-21 Time 10:30	

 SGS EHS Sydney COC
SE223464


Please return completed form to Envirowest Consulting, *A = Solvent rinsed glass jar with Teflon lined lid and green label, B= Plastic with green label, C= Amber with green label, D= Vial with white label, E= Plastic

Sheet 2 of 3

18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35

Chain of Custody Form – Ref 13592

Sheet 1 of 3

Ref: 13592 Investigator: Envirowest Consulting 9 Cameron Place PO Box 8158 ORANGE NSW 2800 (02) 6361 4954 Email: maisie@envirowest.net.au Contact Person: Maisie Dickie Invoice: accounts@envirowest.net.au		Sample matrix		Sample preservation		Analysis									
Laboratory: SGS SYDNEY 16/33 Maddox Street ALEXANDRIA NSW 2015 Quotation #: Envir_70119_2019 Courier/CN: Toll		Water Soil Sludge		Cool HNO3/H Cl Unpre- served		SGS Method Code									
Sample ID		Container*		Sampling Date/Time		CL10				CL1T		OCP		CL2T	
HAS		A		27/08/2021		X		X		X		X		X	
ERDA		A		27/08/2021		X		X		X		X		X	
Investigator: I attest that the proper field sampling procedures were used during the collection of these samples.						Sampler name: Maisie Dickie Date: 27/08/2021 Time: 1630									
Relinquished by: Virginia Bragg (print and signature)						Received by: (print and signature)									
Date: 30/08/2021 Time: 14:00						Date: Time:									

Please return completed form to Envirowest Consulting. *A = Solvent rinsed glass jar with Teflon lined lid and green label. B= Plastic with green label. C= Amber with green label, D= Vial with white label, E= Plastic

CLIENT DETAILS

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Project **13592 - Additional**
 Order Number **13592**
 Samples **37**

LABORATORY DETAILS

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 Laboratory **SGS Alexandria Environmental**
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 Alexandria NSW 2015**

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SGS Reference **SE223464A R0**
 Date Received **21/9/2021**
 Date Reported **28/9/2021**

COMMENTS

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

SIGNATORIES



Shane MCDERMOTT
 Inorganic/Metals Chemist

Hexavalent Chromium in Soil UV/Vis [AN075/AN201] Tested: 27/9/2021

			HS12	ER1C	ER2C	ER3C	ER4C
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			27/8/21 16:30	27/8/21 16:30	27/8/21 16:30	27/8/21 16:30	27/8/21 16:30
PARAMETER	UOM	LOR	SE223464A.012	SE223464A.016	SE223464A.017	SE223464A.018	SE223464A.019
Hexavalent Chromium, Cr6+	mg/kg	0.5	<0.5	0.6	<0.5	0.7	<0.5

			ER5C	ER7C	ER8C	ER9C	ER10C
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			27/8/21 16:30	27/8/21 16:30	27/8/21 16:30	27/8/21 16:30	27/8/21 16:30
PARAMETER	UOM	LOR	SE223464A.020	SE223464A.022	SE223464A.023	SE223464A.024	SE223464A.025
Hexavalent Chromium, Cr6+	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	0.7

METHOD

METHODOLOGY SUMMARY

AN075

This method uses an alkaline digestion to solubilise both water-soluble and water-insoluble forms of hexavalent chromium in solids. The solution is then pH adjusted and the hexavalent chromium concentration in solution determined colourimetrically.

AN201

Cr6+ is determined colourimetrically by reaction with diphenylcarbazide in acid solution. A red-violet colour of unknown composition is produced.

FOOTNOTES

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

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

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

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

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

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

Note that in terms of units of radioactivity:

- 1 Bq is equivalent to 27 pCi
- 37 MBq is equivalent to 1 mCi

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

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

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STATEMENT OF QA/QC PERFORMANCE

SE223464A R0

CLIENT DETAILS

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Project **13592 - Additional**
Order Number **13592**
Samples 37

LABORATORY DETAILS

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SGS Reference **SE223464A R0**
Date Received 21 Sep 2021
Date Reported 28 Sep 2021

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.

This QA/QC Statement must be read in conjunction with the referenced Analytical Report.

The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Extraction Date

Hexavalent Chromium in Soil UV/Vis

10 items

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	10 Soil
Date documentation received	21/9/2021@1:44pm	Type of documentation received	Email
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	15°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Hexavalent Chromium in Soil UV/Vis

Method: ME-(AU)-[ENV]AN075/AN201

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HS12	SE223464A.012	LB233608	27 Aug 2021	21 Sep 2021	24 Sep 2021	27 Sep 2021†	04 Oct 2021	28 Sep 2021
ER1C	SE223464A.016	LB233608	27 Aug 2021	21 Sep 2021	24 Sep 2021	27 Sep 2021†	04 Oct 2021	28 Sep 2021
ER2C	SE223464A.017	LB233608	27 Aug 2021	21 Sep 2021	24 Sep 2021	27 Sep 2021†	04 Oct 2021	28 Sep 2021
ER3C	SE223464A.018	LB233608	27 Aug 2021	21 Sep 2021	24 Sep 2021	27 Sep 2021†	04 Oct 2021	28 Sep 2021
ER4C	SE223464A.019	LB233608	27 Aug 2021	21 Sep 2021	24 Sep 2021	27 Sep 2021†	04 Oct 2021	28 Sep 2021
ER5C	SE223464A.020	LB233608	27 Aug 2021	21 Sep 2021	24 Sep 2021	27 Sep 2021†	04 Oct 2021	28 Sep 2021
ER7C	SE223464A.022	LB233608	27 Aug 2021	21 Sep 2021	24 Sep 2021	27 Sep 2021†	04 Oct 2021	28 Sep 2021
ER8C	SE223464A.023	LB233608	27 Aug 2021	21 Sep 2021	24 Sep 2021	27 Sep 2021†	04 Oct 2021	28 Sep 2021
ER9C	SE223464A.024	LB233608	27 Aug 2021	21 Sep 2021	24 Sep 2021	27 Sep 2021†	04 Oct 2021	28 Sep 2021
ER10C	SE223464A.025	LB233608	27 Aug 2021	21 Sep 2021	24 Sep 2021	27 Sep 2021†	04 Oct 2021	28 Sep 2021

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No surrogates were required for this job.



METHOD BLANKS

SE223464A R0

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Hexavalent Chromium in Soil UV/Vis

Method: ME-(AU)-[ENV]AN075/AN201

Sample Number	Parameter	Units	LOR	Result
LB233608.001	Hexavalent Chromium, Cr6+	mg/kg	0.5	<0.5

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Hexavalent Chromium in Soil UV/Vis

Method: ME-(AU)-[ENV]AN075/AN201

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE223462A.005	LB233608.017	Hexavalent Chromium, Cr6+	mg/kg	0.5	<0.5	0.5	144	1

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Hexavalent Chromium in Soil UV/Vis

Method: ME-(AU)-[ENV]AN075/AN201

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB233608.002	Hexavalent Chromium, Cr6+	mg/kg	0.5	18	20	70 - 130	92

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub-sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spikes were required for this job.

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

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

- * NATA accreditation does not cover the performance of this service .
- ** Indicative data, theoretical holding time exceeded.
- *** Indicates that both * and ** apply.
- Sample not analysed for this analyte.
- IS Insufficient sample for analysis.
- LNR Sample listed, but not received.
- LOR Limit of reporting.
- QFH QC result is above the upper tolerance.
- QFL QC result is below the lower tolerance.
- ① At least 2 of 3 surrogates are within acceptance criteria.
- ② RPD failed acceptance criteria due to sample heterogeneity.
- ③ Results less than 5 times LOR preclude acceptance criteria for RPD.
- ④ Recovery failed acceptance criteria due to matrix interference.
- ⑤ Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
- ⑥ LOR was raised due to sample matrix interference.
- ⑦ LOR was raised due to dilution of significantly high concentration of analyte in sample.
- ⑧ Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
- ⑨ Recovery failed acceptance criteria due to sample heterogeneity.
- ⑩ LOR was raised due to high conductivity of the sample (required dilution).
- † Refer to relevant report comments for further information.

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CLIENT DETAILS

Contact Leah Desborough
Client ENVIROWEST CONSULTING PTY LIMITED
Address PO BOX 8158
ORANGE NSW 2800

Telephone 61 2 63614954
Facsimile (Not specified)
Email leah@envirowest.net.au

Project **13592-1**
Order Number **13592-1**
Samples 4

LABORATORY DETAILS

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

Telephone +61 2 8594 0400
Facsimile +61 2 8594 0499
Email au.environmental.sydney@sgs.com

SGS Reference **SE224091 R0**
Date Received 29/9/2021
Date Reported 7/10/2021

COMMENTS

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

SIGNATORIES



Bennet LO
Senior Chemist



Shane MCDERMOTT
Inorganic/Metals Chemist



ANALYTICAL RESULTS

SE224091 R0

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 5/10/2021

			ER11D	ER12D	ER13D	ER14D
			SOIL	SOIL	SOIL	SOIL
			-	-	-	-
			27/9/2021	27/9/2021	27/9/2021	27/9/2021
PARAMETER	UOM	LOR	SE224091.001	SE224091.002	SE224091.003	SE224091.004
Zinc, Zn	mg/kg	2	53	65	100	45

Moisture Content [AN002] Tested: 30/9/2021

			ER11D	ER12D	ER13D	ER14D
			SOIL	SOIL	SOIL	SOIL
			-	-	-	-
			27/9/2021	27/9/2021	27/9/2021	27/9/2021
			SE224091.001	SE224091.002	SE224091.003	SE224091.004
PARAMETER	UOM	LOR				
% Moisture	%w/w	1	14.0	14.5	32.6	9.7

METHOD

METHODOLOGY SUMMARY

AN002

The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.

AN040/AN320

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

AN040

A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.

FOOTNOTES

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

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

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

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

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

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

Note that in terms of units of radioactivity:

- 1 Bq is equivalent to 27 pCi
- 37 MBq is equivalent to 1 mCi

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

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

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STATEMENT OF QA/QC PERFORMANCE

SE224091 R0

CLIENT DETAILS

Contact Leah Desborough
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Address PO BOX 8158
ORANGE NSW 2800

Telephone 61 2 63614954
Facsimile (Not specified)
Email leah@envirowest.net.au

Project **13592-1**
Order Number **13592-1**
Samples 4

LABORATORY DETAILS

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

Telephone +61 2 8594 0400
Facsimile +61 2 8594 0499
Email au.environmental.sydney@sgs.com

SGS Reference **SE224091 R0**
Date Received 29 Sep 2021
Date Reported 07 Oct 2021

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.

This QA/QC Statement must be read in conjunction with the referenced Analytical Report.

The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met (within the SGS Alexandria Environmental laboratory).

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	4 Soil
Date documentation received	29/9/2021	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	15.5°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Moisture Content

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
ER11D	SE224091.001	LB233907	27 Sep 2021	29 Sep 2021	11 Oct 2021	30 Sep 2021	05 Oct 2021	05 Oct 2021
ER12D	SE224091.002	LB233907	27 Sep 2021	29 Sep 2021	11 Oct 2021	30 Sep 2021	05 Oct 2021	05 Oct 2021
ER13D	SE224091.003	LB233907	27 Sep 2021	29 Sep 2021	11 Oct 2021	30 Sep 2021	05 Oct 2021	05 Oct 2021
ER14D	SE224091.004	LB233907	27 Sep 2021	29 Sep 2021	11 Oct 2021	30 Sep 2021	05 Oct 2021	05 Oct 2021

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
ER11D	SE224091.001	LB234079	27 Sep 2021	29 Sep 2021	26 Mar 2022	05 Oct 2021	26 Mar 2022	07 Oct 2021
ER12D	SE224091.002	LB234079	27 Sep 2021	29 Sep 2021	26 Mar 2022	05 Oct 2021	26 Mar 2022	07 Oct 2021
ER13D	SE224091.003	LB234079	27 Sep 2021	29 Sep 2021	26 Mar 2022	05 Oct 2021	26 Mar 2022	07 Oct 2021
ER14D	SE224091.004	LB234079	27 Sep 2021	29 Sep 2021	26 Mar 2022	05 Oct 2021	26 Mar 2022	07 Oct 2021

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No surrogates were required for this job.

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result
LB234079.001	Zinc, Zn	mg/kg	2	<2

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Moisture Content

Method: ME-(AU)-[ENV]AN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE224091.004	LB233907.011	% Moisture	%w/w	1	9.7	11.9	39	21

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE224131.002	LB234079.014	Zinc, Zn	mg/kg	2	10	8	52	22
SE224131.011	LB234079.024	Zinc, Zn	mg/kg	2	110	140	32	23



LABORATORY CONTROL SAMPLES

SE224091 R0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB234079.002	Zinc, Zn	mg/kg	2	280	273	80 - 120	102

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub-sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES**Method: ME-(AU)-[ENV]AN040/AN320**

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE224091.001	LB234079.004	Zinc, Zn	mg/kg	2	94	53	50	81

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

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

- * NATA accreditation does not cover the performance of this service .
- ** Indicative data, theoretical holding time exceeded.
- *** Indicates that both * and ** apply.
- Sample not analysed for this analyte.
- IS Insufficient sample for analysis.
- LNR Sample listed, but not received.
- LOR Limit of reporting.
- QFH QC result is above the upper tolerance.
- QFL QC result is below the lower tolerance.
- ① At least 2 of 3 surrogates are within acceptance criteria.
- ② RPD failed acceptance criteria due to sample heterogeneity.
- ③ Results less than 5 times LOR preclude acceptance criteria for RPD.
- ④ Recovery failed acceptance criteria due to matrix interference.
- ⑤ Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
- ⑥ LOR was raised due to sample matrix interference.
- ⑦ LOR was raised due to dilution of significantly high concentration of analyte in sample.
- ⑧ Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
- ⑨ Recovery failed acceptance criteria due to sample heterogeneity.
- ⑩ LOR was raised due to high conductivity of the sample (required dilution).
- † Refer to relevant report comments for further information.

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Chain of Custody Form – Ref 13592-1

Sheet 1 of 1

Ref: 13592-1 Investigator: Envirowest Consulting 9 Cameron Place PO Box 8158 ORANGE NSW 2800 (02) 6361 4954 Telephone: Email: leah@envirowest.net.au Contact Person: Leah Desborough Invoice: accounts@envirowest.net.au Laboratory: SGS SYDNEY 16/33 Maddox Street ALEXANDRIA NSW 2015 Quotation #: Courier/CN:		Sample matrix Water Soil Sludge			Sample preservation Cool HNO3/HCl Unpre-served			Analysis SGS Method Code		
Sample ID ER11D ER12D ER13D ER14D	Container* A A A A	Sampling Date/Time 27/9/2021 27/9/2021 27/9/2021 27/9/2021	X X X X	X X X X	X X X X	Zinc X X X X				
Investigator: I attest that the proper field sampling procedures were used during the collection of these samples.			Sampler name: Leah Desborough Date: 27/09/2021			Time: 16:00				
Relinquished by: Virginia Bragg (print and signature)			Received by: Leah Desborough (print and signature)			Date: 29/9/21 Time: 7:11				

Please return completed form to Envirowest Consulting, *A = Solvent rinsed glass jar with Teflon lined lid and green label, B= Plastic with green label, C= Amber with green label, D= Vial with white label, E= Plastic with red label

Appendix 5. EW Testing Services laboratory report

Envirowest Consulting Pty Ltd ABN 18 103 955 246 trading as

EW Testing Services

- 9 Cameron Place, PO Box 8158, Orange NSW 2800 • Tel (02) 6361 4954 •
- Email admin@envirowest.net.au • Web www.envirowest.net.au •

Environmental
Geotechnical
Asbestos
Services



ASBESTOS IDENTIFICATION REPORT

Client	Wakefield Ashurst Developments	Report number	LR13592id
Contact	Peter Morley		
Address	PO Box 359 Castle Hill NSW 1765	Date	30/08/2021

Site location	Golf Course Heights Estate Euchareena Road Molong NSW 2866
Sampled by	Leah Desborough
Date received	27/08/2021
Date tested	30/08/2021
Test method	Identification using polarized light microscopy with dispersion staining in accordance with <i>Method for the qualitative identification of asbestos in bulk samples</i> (AS4964-2004) and EW Testing Services in-house method TA2.

Sample id	Location	Description	Results
13592-1	Stockpile	33g fibrous cement	No asbestos detected. * Organic fibres present.
13592-2	Stockpile	16g fibrous cement sheet, dimpled and with some orange paint on one side	Chrysotile (white asbestos) detected Amosite (brown asbestos) detected

Comments:

* Trace analysis performed.

Sampling: NATA accreditation does not cover the performance of this service

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Carmen King

Carmen King
Approved asbestos analyst



Accredited for compliance with
ISO/IEC 17025 – Testing
Accreditation number: 19800

Appendix 6. Soil sampling protocols

1. Sampling

The samples will be collected from the auger tip, mattock, hand auger or excavator bucket immediately on withdrawal.

The time between retrieval of the sample and sealing of the sample container will be kept to a minimum.

The material will be collected using single use disposal gloves or a stainless-steel spade which represented material which has not been exposed to the atmosphere prior to sampling.

All sampling jars will be filled as close to the top as possible to minimise the available airspace within the jar.

2. Handling, containment and transport

Daily sampling activities will be recorded including sampling locations, numbers, observations, measurements, sampler, date and time and weather condition.

The sampling jars will be new sterile glass jars fitted with plastic lid and airtight Teflon seals, supplied by the laboratories for the purpose of collecting soil samples for analysis. Sample containers will be marked indelibly with the sample ID code to waterproof labels affixed to the body of the container.

All samples will be removed from direct sunlight as soon as possible after sampling and placed in insulated containers. Samples will be stored in a refrigerator at 4°C prior to transportation to the laboratory in insulated containers with ice bricks in accordance with AS4482.1.

Handling and transportation to the laboratory will be accompanied with a chain of custody form to demonstrate the specimens are properly received, documents, processed and stored.

Maximum holding time for extraction (AS4482.1) are:

Analyte	Maximum holding time
Metals	6 months
Mercury	28 days
Sulfate	7 days
Organic carbon	7 days
OCP, OPP, PCB	14 days
TRH, BTEX, PAH, phenols	14 days

3. Decontamination of sampling equipment

Sampling tools will be decontaminated between sampling locations by

- Removing soil adhering to the sampling equipment by scraping, brushing or wiping
- Washing with a phosphate-free detergent
- Rinsing thoroughly with clean water
- Repeating if necessary
- Collect rinsate per sampling time and preserve according to AS 2031.1
- Dry equipment with disposable towels or air

Appendix 7. Unidentified finds procedure

Unidentified finds procedure

1. Introduction

Residential land-use is proposed for *Golf Course Heights Estate*, Euchareena Road, Molong NSW.

A procedure is required describing the actions if potential contamination or hazards are encountered during demolition / soil disturbance / subdivision / excavation / construction activities.

2. Scope

Prepare a procedure to enable the identification and management of unexpected hazards identified during excavation works and/or construction activities.

3. Site identification

Golf Course Heights Estate, Euchareena Road, Molong NSW

4. Responsible person

The landowner / site supervisor is responsible for implementation of the unexpected finds protocol. The landowner will appoint an environmental scientist to induct and provide information on hazard identification and responses to earthwork supervisors and personnel which may uncover unexpected hazards.

5. Identification of unexpected hazards

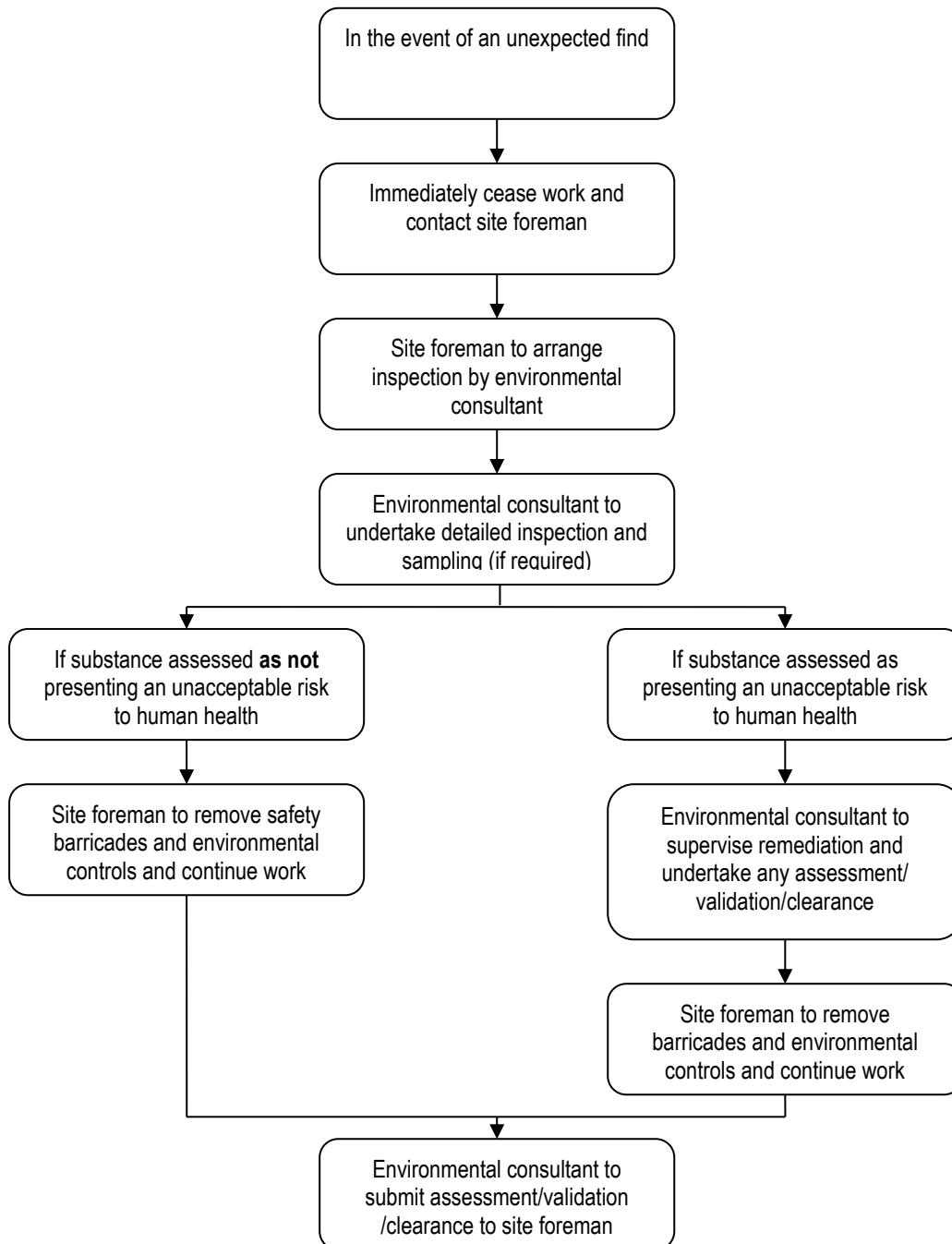
Potential hazards will be identified by appearance and odour include:

- A filled pit or gully
- Demolition waste
- Discoloured soil
- Oil/diesel/tar
- Sheens on water
- An offensive odour
- Asbestos cement sheeting
- Ash or slag
- Underground storage tank

6. Training and induction

All excavation/construction personnel are to be inducted on the identification of potential hazards. The induction can be undertaken at the time of general site induction and toolbox meetings. The training will include display of information to alert worker of potential hazards.

7. Procedure



8. Recommencement of works

The potential hazards will be assessed by the environmental scientist and a report prepared describing:

- Preliminary assessment of the contamination and need for clean-up
- Preparation of a remediation action plan
- All works to be undertaken in accordance with contaminated site regulations and guidelines
- Remediation works
- Validation of the remediation
- Works can commence on the potentially hazardous area after the environmental scientist has provided a clearance.

**BE AWARE
UNEXPECTED HAZARDS MAY BE PRESENT**



drums



asbestos



chemical bottles



blood stains



odour



ash / slag



demolition waste

if you SEE or SMELL anything unusual



STOP WORK & contact the Site Foreman



do not restart working before the area has been
investigated and cleared by an Environmental
Consultant