Preliminary contamination investigation

172 Spring Hill Road, Spring Hill NSW

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Summary report

Introduction

A rural-residential subdivision is proposed for 172 Spring Hill Road, Spring Hill NSW. The development will include creation of nine lots with sizes ranging from 2 to 3.4 hectares. A dwelling is existing on proposed Lot 7 and building envelopes are proposed for the remainder lots. Historical and current land-use was grazing. An investigation of the site is required to determine the soil contamination status and suitability for residential land-use.

Objective

The objective 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, review of available information, soil sampling and analysis.

Summary

An inspection of the site was undertaken on 1 March 2023. The site is agricultural land used for the grazing of sheep. Agricultural infrastructure is present in the southern section of the site on proposed Lots 7 and 9 including two hay sheds (Sheds A and B), a workshop (Shed C), cattle yards, dilapidated sheep yards and a sheep footbath. Two spray carts and an AST are also present in the area. Storage of foreign materials occurs to the south of Shed B and around Shed C.

Vegetation across the site was generally 100% and included pasture grasses and broadleaved weeds. Gravel hardstand was present as tracks around the sheds and within the cattleyards. Bare areas were present beneath the spray carts.

Soil samples were collected across the paddocks at the 0 to 100mm soil depth. Soil samples were collected around areas of environmental concern from the 0 to 100 and 50 to 150mm soil depth to provide a preliminary assessment of potential contamination outside proposed building envelopes.

Levels of potential contaminants throughout the paddocks and within nominated building envelopes were less than the adopted thresholds.

Elevated levels of zinc exceeding the ecological investigation levels were identified around the spray carts, Shed C and the drum store south of Shed B. Elevated levels of PAH exceeding the health and ecological investigation levels were identified south of Shed B. The locations are outside proposed building envelopes. The identified contamination has not been delineated.

Storage of foreign materials south of Shed B and around Shed C is an amenity issue.

Detailed investigations around areas of infrastructure are required to ensure all areas of contamination have been identified. The further investigations should include delineation of known contamination to enable remediation to be undertaken.

The proposed building envelopes are suitable for residential land-use. Areas outside building envelopes require remediation.

Recommendations

Decommissioning of the infrastructure is likely to occur following subdivision. A detailed investigation should be undertaken around the infrastructure prior to decommissioning to enable identification of all areas of contamination. The detailed investigation should include delineation of identified contamination and additional sampling and analysis to improve confidence in results.

Remediation of the identified contamination is required to be undertaken in accordance with a remedial action plan (RAP).

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

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1. Introduction

A rural-residential subdivision is proposed for 172 Spring Hill Road, Spring Hill NSW. The development will include creation of nine lots with sizes ranging from 2 to 3.4 hectares. A dwelling is existing on proposed Lot 7 and building envelopes are proposed for the remainder lots. Historical and current land-use was grazing. An investigation of the site is required to determine the soil contamination status and suitability for residential land-use.

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 Sue Stewart to undertake a preliminary contamination assessment, in accordance with the contaminated land management planning guidelines, from the *Contaminated Land Management Act 1997* and the *State Environmental Planning Policy (Resilience and Hazards) 2021* of 172 Spring Hill Road, Spring Hill NSW. The scope of works included site inspection, review of available information, soil sampling and analysis.

4. Site identification

Address	172 Spring Hill Road Spring Hill NSW
Deposited plans	Lot 4 DP243203
Latitude and longitude	-33.41^{o} 149.15^{o}
Geographic coordinates	55H E699572m N6301365m
Client	Sue Stewart
Owner	SL Stewart and Set. Late IJ Stewart
Current occupier	Sue Stewart
Area	Approximately 23ha
Local government area	Cabonne Council
Current zoning	RU1 – Primary production (Cabonne LEP 2012)
Trigger for investigation	Change in land-use
Locality map	Figure 1

5. Site history

5.1 Land-use

The site is agricultural land used for the grazing of sheep. Infrastructure comprising sheds and stock handling yards are present in the southern section of the site.

5.2 Summary of council records

Part of the southern section of the site is mapped in the Cabonne LEP (2012) within a biodiversity area. The site is mapped as a groundwater vulnerable area (Cabonne LEP 2012).

A Section 10.7 certificate was obtained for 172 Spring Hill Road, Spring Hill NSW (Appendix 8). Cabonne Council has not received notice under the *Contaminated Land Management Act 1997* that the land is:

- significantly contaminated
- subject to a management order
- subject of an approved voluntary management proposal
- subject to an ongoing maintenance order
- subject to a site audit statement.

Review of the Section 10.7 certificate identified the site was not proclaimed to be a Mines Subsidence District.

5.3 EPA databases

The investigation area is not listed on the NSW EPA register of contaminated sites (12 April 2023) or sites notified to the EPA (11 April 2023).

No sites listed on NSW EPA register of contaminated sites or sites notified to the EPA have been identified within 1km of the site.

5.4 Safework NSW Storage of hazardous chemicals

A search of the SafeWork dangerous goods database was considered not necessary. One above ground fuel storage tank was identified in the southern section of the site. No other tanks or use of fuel were identified from the searches and past land-uses.

5.5 POEO public register

The site is not listed on the NSW EPA POEO public register.

Sites listed on NSW EPA POEO public register have not been identified within 1km of the site.

5.6 Other government agency databases

The site is not listed on the following databases:

- National Liquid Fuel Facilities database
- The NSW Government PFAS Investigation Program
- Defence PFAS Investigation Program
- Defence PFAS Management Program
- Defence 3 Year Regional Contamination Investigation Program
- Airservices Australia National PFAS Management Program

No sites listed on government agency databases have been identified within 1km of the investigation area.

5.7 Sources of information

Site inspection 1 March 2023 by Envirowest Consulting Pty Ltd

NSW EPA records of public notices under the CLM Act 1997
Soil and geological maps
Aerial images
Cabonne LEP 2012

5.8 Review of historic aerial photographs, maps and plans

Year	Visual observations on site and surrounding land
1964	The site appears to be part of a larger property which extends to the north and west. Land-use appears grazing. Three sheds present. Shed A is expected to be the current open hay shed, Shed B is expected to be the current enclosed hay shed and Shed C is expected to be the current workshop. Infrastructure is present on the south western corner of Shed B. Remnant vegetation present through southern section of the site. One dam (Dam 1) present in the central eastern section of the site. Neighbouring land-use appears grazing agriculture.
1972	Some alterations to the paddock configuration have occurred. A structure is present to the east of Shed B and may be associated with a well known to be present in this location. The infrastructure on the south western corner of Shed B is not visible. Tracks are present in the southern section of the site.
1984	Paddock configuration is similar to the current layout. A dwelling has been constructed in the central section of the site. A track has been formed from Spring Hill Road to the dwelling site. Dams have been constructed along the western boundary (Dam 2) and in central northern section of the site (Dam 3). The structure to the east of Shed B is not visible.
1989	No changes evident on the site.
1993	Shed C and two associated silos are clearly visible. Some materials are present to the south and south west of Shed B. A dam (Dam 4) is present in the central southern section of the site.
1998	A surface diversion drain has been constructed in the eastern section of the site and is expected to convey water to Dam 1.
2003	The photo is partly obscured. Vegetation appears desiccated expected to be due to weather conditions.
2006	Light coloured material has been applied to the area south of Shed B and expected to be gravel hardstand.
2010	Several items appear present south of Shed B.
2016	A dam (Dam 5) has been formed north of the dwelling.
2017	Items are present to the south west and west of Shed B. Vegetation is beginning to obscure the area south of Shed B.
2020	An item is present east of Shed B and is expected to be the current spray cart identified as Spray cart 2. Residential dwelling constructed adjacent the northern boundary.
2021	An item is present at the north eastern corner of Shed B. The item is expected to be the current spray cart identified as Spray cart 1. Foreign materials are present south of Shed B. A stockpile of timber is present in the south western section. Surface diversion drains have been formed to direct water into Dam 3 and Dam 4. An excavator is present along the western boundary and is expected to be desilting a dam located on the neighbouring lot to the west.

5.8.2 Topographic maps

The 1986 topographic map based on 1987 aerial photography and field revision in 1988 depicts the southern section of the site as containing scattered vegetation. Intermittent drainage lines travers the site east to west. A track is present in the eastern section adjacent to buildings. Two dams are depicted within the drainage line.

5.8.3 Historical parish maps

The 1882 to 1954 historical parish maps indicate that the site was part of a two larger parcels of land owned by George Chapman. George Chapman also owned lots to the north and east.

5.9 Heritage listings

The site is not listed on the following government heritage databases:

- Commonwealth Heritage List
- National Heritage List
- State Heritage Register
- Local Environmental Plan (Cabonne LEP 2012)

The site is identified as being within 1km of seven items on Cabonne LEP. The sites include the Spring Hill Conservation Area, All Saints Anglican Church, Spring Hill Public School, Temperance Hall, shed at 7 Spring Street, Railway Hotel and Former Spring Hill Railway Station. The historical sites are not expected to have impacted on the contamination status of the site.

No items listed on the Commonwealth Heritage List, National Heritage List or State Heritage Register are located within 1km of the site.

5.10 Chronological list of site uses

The original European land-use of the site is expected to have been grazing as part of a larger property. Infrastructure for the property was located in the southern section of the investigation area and may have also been located in other areas of the property outside the investigation area. Sheds A, B and C are identifiable from the 1964 aerial photograph. Other improvements to the property since this time has included construction of a dwelling and surface drains and dams.

5.11 Buildings and infrastructure

Three sheds are currently located on the site (Figure 3). Shed A is an open shed with earth floor used for storage of hay.

Shed B is an enclosed colourbond shed with concrete floor. Shed B was being used for storage of hay and farm machinery at the time of inspection. An approximately 1,000L above ground fuel tank is located on the north western corner of the shed. Two spray carts were located on the northern and eastern sides of Shed B.

Shed C was reportedly a former dairy now being used as a workshop. The shed has iron walls and a concrete floor. The shed was being used for storage including farm tools and equipment and fuel containers. Silos are located at the north western corner of the shed.

Dilapidated sheep yards including a sheep footbath and sump are located south west of Shed B. Cattle yards are located west of Shed B.

The paddocks are fenced. Four dams are located throughout the paddocks. Surface diversion drains have been formed in the central and northern sections of the site to divert surface water flows into dams.

5.12 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.

Stained concrete indicating spills of hydrocarbon were present on the concrete floor within Shed C. Spills may have occurred around the AST during refilling activities.

5.13 Relevant complaint history

Nil

5.14 Previous investigations

None known

5.15 Historical neighbouring land-use

North – Grazing
South – Grazing
East – Spring Hill Road, grazing
West – Grazing

Historical neighbouring land-use are not expected to be impacting on the contamination status of the site.

5.16 Contaminant sources

Potential exists for contaminating activities to have been undertaken on site which may impact on the suitability for the proposed land-use. Grazing land-use may have resulted in application of pesticides in routine management of pastures. Fertilisers applied may contain heavy metal contaminants. No bio solids are known to have been applied to the site.

Leaks and spill of oils and fuels may have occurred due to the storage of fuels in the AST, drums stored south of Shed B and containers stored in Shed C. Concrete discolouration was observed in Shed C. Discolouration was not identified around the AST or drum storage area.

The spray carts are expected to have contained pesticides which may have resulted in spills and leakages.

Storage of farm tools and equipment and batteries may have resulted in spills and leakages resulting in release of contaminants.

Chemicals most likely used in the sheep footbath and sump are those registered for the control of stock parasites. The potential contaminants of concern are persistent products including arsenic, zinc, organophosphorus and organochlorine compounds.

Storage of foreign material on-site was identified during the site inspection. Inert foreign materials comprising metal, wire, bricks, drums, welding unit, farm machinery, tiles, tyres and ag pipe was identified south of Shed B. Hose, drums, buoys and metal was identified around Shed C. Inert foreign materials are considered an amenity issue.

5.17 Contaminants of concern

Based on the grazing land-use and site inspection the contaminants of concern are:

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

Based on the storage of fuels the contaminants of concern are:

- Lead
- Total recoverable hydrocarbons (TRH)
- Benzene, toluene, ethylbenzene, xylenes, naphthalene (BTEXN)
- Polycyclic aromatic hydrocarbons (PAH)

Based on the presence of spray carts on the site, the contaminants of concern are:

- Heavy metals (arsenic, cadmium, chromium, copper, nickel, lead and zinc)
- Organochlorine and organophosphorus pesticides (OC/OPP)

Based on the storage of farm tools and equipment and batteries within Shed C, the contaminants of concern are:

- Heavy metals (arsenic, cadmium, chromium, copper, nickel, lead, zinc and mercury)
- TRH
- BTEXN
- PAH

Based on the presence of the sheep footbath on the site, the contaminants of concern are:

- Heavy metals (arsenic, cadmium, chromium, copper, nickel, lead and zinc)
- OC/OPP

5.18 Integrity assessment

The site history was obtained from site inspections 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 environment

6.1 Site inspection

The site was inspected by Leah Desborough of Envirowest Consulting Pty Ltd on 1 March 2023.

6.2 Land-use

The site is agricultural land used for sheep grazing. Infrastructure is present in the southern section of the site.

6.3 Current neighbouring land-use

North – Grazing, rural-residential
South – Grazing, rural-residential
East – Spring Hill Road, grazing, rural-residential
West – Grazing

Neighbouring land-uses are not expected to impact on the site.

6.4 Surface cover and vegetation

Surface cover on the site was generally 100% and consisted of Phalaris, cocksfoot, rye grass with some broadleaved weeds. Water tolerant vegetation was identified in moderately drained areas of the site.

Remnant eucalypts are present through the southern section of the site.

Gravel hardstand is present along access tracks and around the cattle yards and Shed B.

6.5 Evidence of visible contamination

Foreign materials were observed adjacent Sheds B and C.

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

Stained concrete was identified within Shed C. The concrete is expected to have restricted downward movement of potential contaminants into the soil.

6.6 Topography

The site is located on a mid slope with an inclination predominately 1 to 2% to the west.

6.7 Soils and geology

The site is located within the Spring Hill Soil Landscape (NSW Government nd). The dominant soils are krasnozems consisting of dark reddish brown loam with a gradual change to dark reddish brown clay loam. Yellow podzolic soils occur on the lower slopes and yellow solodic soils in drainage lines.

Parent rock comprises basalt flows separated by volcanic ash forming layers of clay and slate (NSW Government nd).

6.8 Water

6.8.1 Surface water

Surface water on site flows into constructed diversion drains and into dams and an intermittent drainage lines which traverses the site in an east-west direction. The drainage lines empty into Cowriga Creek located west and south of the site. Five dams are located on the site.

6.8.2 Groundwater

Three groundwater bores are located in the southern section of the site from review of the NSW Government Water NSW website (2023). Eight groundwater bores are located within 500m of the site. The bores are licensed for stock, domestic and irrigation with standing water levels from 2m (Table 1). Water bearing zones listed were greater than 10m in basalt.

Table 1. Groundwater bores within 500m

No.	Year drilled	Location	SWL (m)	Use	Status
GW050844	1979	On-site	1.9	Stock	-
GW050732	1979	On-site	-	Stock	-
GW058711	1983	On-site	12	Stock, domestic	Needs reconditioning
GW063669	1986	60m S	5.5	Domestic	Current
GW804900	2011	50m E	12	Stock, domestic	Supply obtained
GW704397	2010	411m NE	10	Stock, domestic	Supply obtained
GW704514	2010	450m N	12	Stock, domestic	Supply obtained
GW704398	2010	415m NE	8	Stock, domestic	Supply obtained
GW706753	-	420m W	-	-	-
GW062265	1986	450m W	-	Irrigation	Current
GW053308	-	240m SE	2	Stock, domestic	Well, supply obtained

A well was identified to the east of Shed B. Well details are not known.

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 27 April 2023).

The site is mapped as a geological unit with low asbestos potential (NSW SEED Portal accessed 27 April 2023).

6.10 Environmentally sensitive features or habitats

Part of the southern section of the site is mapped as a biodiversity area. The site is mapped as an area of groundwater vulnerability.

6.11 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.

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. Grazing land-use may have resulted in application of pesticides in routine management of pastures. Fertilisers applied may contain heavy metal contaminants. No bio solids are known to have been applied to the site.

Leaks and spill of oils and fuels may have occurred due to the storage of fuels in the AST, drums south of Shed B and containers in Shed C. Concrete discolouration was observed in Shed C. Discolouration was not identified around the AST or drum storage area.

The spray carts are expected to have contained pesticides which may have resulted in spills and leakages.

Storage of farm tools and equipment and batteries may have resulted in spills and leakages resulting in release of contaminants.

Chemicals most likely used in the sheep footbath and sump are those registered for the control of stock parasites. The potential contaminants of concern are persistent products including arsenic, zinc, organophosphorus and organochlorine compounds.

Storage of foreign material on-site was identified during the site inspection. Inert foreign materials comprising metal, wire, bricks, drums, welding unit, farm machinery, tiles, tyres and ag pipe was identified south of Shed B. Hose drums, buoys and metal was identified around Shed C. Inert foreign materials are considered an amenity issue.

7.2 Contaminants of concern

Based on the grazing land-use and site inspection the contaminants of concern are:

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

Based on the storage of fuels the contaminants of concern are:

- Lead
- Total recoverable hydrocarbons (TRH)
- Benzene, toluene, ethylbenzene, xylenes, naphthalene (BTEXN)
- Polycyclic aromatic hydrocarbons (PAH)

Based on the presence of spray carts on the site, the contaminants of concern are:

- Heavy metals (arsenic, cadmium, chromium, copper, nickel, lead and zinc)
- Organochlorine and organophosphorus pesticides (OC/OPP)

Based on the storage of farm tools and equipment and batteries within Shed C, the contaminants of concern are:

- Heavy metals (arsenic, cadmium, chromium, copper, nickel, lead, zinc and mercury)
- TRH
- BTEXN
- PAH

Based on the presence of the sheep footbath on the site, the contaminants of concern are:

- Heavy metals (arsenic, cadmium, chromium, copper, nickel, lead and zinc)
- OC/OPP

7.3 Potential receptors

The proposed land-use of the site is rural-residential and expected to include residential dwellings with landscapes areas. Residual areas are expected to comprise low intensity grazing.

Human receptors include:

- Residents (adults and children)
- Visitors (adults and children)
- 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 the 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 rural-residential and human receptors to the investigation area will occur. 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. Following development it is expected that the majority of the site will remain pastures with areas of soft landscaping and hard surfaces around dwellings and associated infrastructure.

Inhalation may occur as a result of vaporisation, 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 production.

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 and hard surfaces constructed which will control sediment movement from the site. Surface water from the site is expected to flow to intermittent drainage lines and into Cowriga Creek located off-site to the west and south. Cowriga Creek is considered to be a highly disturbed ecosystem due to disturbance from agriculture.

Groundwater is not identified as a potential receptor to contamination. Groundwater in the locality is located at depths greater than 2m confined in basalt. Contaminants are expected to originate from the soil surface. Clay subsoils and rock are expected to restrict the downward movement of contaminants.

Source/contaminants	**Transport**	**Potential exposure pathways**	**Receptors**
☒ Pesticides Heavy metals Organochlorine pesticides (OCP) Organophosphorous pesticides (OPP)	☐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 ☒Vegetation ☐Aquatic receptors
☒ Fertilisers Heavy metals	☐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 ☒Vegetation ☐Aquatic receptors
☒ Storage of chemicals Heavy metals OCP OPP	☐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 ☒Vegetation ☐Aquatic receptors
☒ AST and storage of fuels Hydrocarbons Lead	☐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 ☒Vegetation ☐Aquatic receptors
☒ Foreign materials	☐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 ☐Vegetation ☐Aquatic receptors

☒Potential, ☐unknown/unlikely

8. Data quality objectives (DQO)

8.1 State the problem

A large lot residential development is proposed for the site. Land-use will change from agriculture including infrastructure to residential. The agricultural land-use may have resulted in application of pesticides, fertilisers and contaminating activities to the site. Pesticides may have been used to treat sheep at the footbath area. Storage of chemicals and fuels may have resulted in leaks and spills.

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 11. The decision problem is, do the levels of potential contaminants exceed the assessment criteria listed in Section 11.

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 172 Spring Hill Road, Spring Hill NSW.

8.5 Develop a decision rule

Data collected for the purpose of the contamination investigation must be sufficiently accurate to be representative. The accuracy will be assessed by determination of:

- Current and historical land-use to describe potential contamination sources
- Site setting, potential receptors and pathways
- Soil samples to characterise potential contamination and analysis at accredited laboratories.

The adopted criteria is suitability for residential land-use and includes the thresholds listed in Schedule B1 of the NEPM (1999) *Guideline on Investigation Levels for Soil and Groundwater*. The data must be sufficiently representative to identify the extent of contamination and if further sampling and analysis is needed to delineate the nature and extent of contamination.

The decision rule for the investigation are:

- If the contamination levels were less than the adopted levels are potential risks low and acceptable
- If the levels were equal or greater that the investigations levels will exceedances affect the suitability for the proposed land-use.

8.6 Specify acceptable limits on the decision errors

A decision error in the context of the decision rule would lead to either underestimation or over estimation of the risk level associated with the property. Decision errors include:

- Limitations in available site history information
- Constraints associated with the ability to access certain areas of a site
- Errors in the sampling plan
- Data quality including comparability, representativeness and accuracy for data collection and analysis
- Analytic data validation

Where sample analysis is undertaken the quality of the data collected was assessed on a range of factors including:

- Documentation and data completeness

- Reference to relevant guidance documents
- Consistency of methodology
- Data quality including comparability, representativeness and accuracy for data collection and analysis
- Analytical data validation
- The 95% upper confidence interval of average levels of samples collected is less than the threshold levels, the results are less than 250% of relevant thresholds and the standard deviation is less than 50% of the assessment criteria.

8.7 Optimize the design for obtaining data

The methodology present in Sections 9 and 10 presents a framework for the contamination investigation which has been designed to meet the scope objectives and the nominated DQO.

Optimisation of the data collection process was informed by a review of historical information and observations made at the time of site inspection. The sampling was used to inform the potential contamination status of the site. The scope of work was undertaken to a level of accuracy and confidence in the ASC NEPM (NEPC 1999).

Analytes included heavy metals, TRH (C6-C40), BTEXN, PAH, OCP and OPP.

9. Sampling analysis plan and sampling methodology

9.1 Sampling strategy

9.1.1 Sampling design

Visual inspections were undertaken over the site for indicators of contamination.

A probabilistic systematic sampling pattern was adopted to assess the probable location of contamination on the general site. Sample locations were based on paddock areas which are considered to have similar management.

A judgemental sampling pattern was adopted to assess potential areas of environmental concern (AEC).

9.1.2 Sampling locations

Soil samples were collected from the general site on an approximate 100m grid pattern. Twenty three discrete soil samples were collected for analysis.

Ten soil samples were collected from AEC. AEC assessed included AST, storage locations of two spray carts, downslope of battery storage area and Shed C, drum storage area, sheep footbath and sump and cattle crush location.

The sampling locations are described in Figure 3.

9.1.3 Sampling density

The general site sampling density can detect a potential hot spot across the site with a radius of 60m at a 95% level of confidence. The sampling density is less than the minimum locations recommended by EPA (2022) but sufficient based on land-use history.

Sampling density of potential AEC is low but sufficient to enable preliminary characterisation.

9.1.4 Sampling depth

Soil samples were collected across the general site and AEC with potential top down contamination from the 0-100mm soil depth. Samples were collected from a soil depth of 50 to 1500mm in areas of potential hydrocarbons contamination. Any heavy metals present are generally immobile and expected to be contained in the top 100mm of soil.

9.2 Analytes

Soil samples collected from the general site were evaluated for arsenic, cadmium, chromium, copper, lead, nickel and zinc. Heavy metals and pesticides were identified as the contaminants of concern possibly present as a result of agricultural land-use.

Soil samples collected from the AST were analysed for TRH, BTEXN, PAH and lead. Samples collected from the battery store and Shed C and drum store at Shed B were analysed for arsenic, cadmium, chromium, copper, lead, nickel, zinc, mercury, TRH (C6-C40), BTEXN and PAH. Soil samples collected from the spray cart storage areas, sheep footbath and sump and cattle crush were analysed for arsenic, cadmium, chromium, copper, lead, nickel, zinc, OCP and OPP.

Table 2. Schedule of samples and analyses

Sample ID	Location	Depth (mm)	Analysis undertaken
SP1-SP23	General site	0-100	Arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), Nickel (Ni), zinc (Zn)
HS1	AST	50-150	Total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene, xylenes, naphthalene (BTEXN), polycyclic aromatic hydrocarbons (PAH), lead
HS2	Spray cart 1	0-100	As, Cd, Cr, Cu, Pb, Ni, Zn, Organochlorine pesticides (OCP), Organophosphorus pesticides (OPP)
HS3	Spray cart 2	0-100	As, Cd, Cr, Cu, Pb, Ni, Zn, OCP, OPP
HS4	Downslope of battery store area and Shed C	50-150	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH, BTEXN, PAH
HS5	Drum store south of Shed B	50-150	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH, BTEXN, PAH
HS6	Sheep footbath	0-100	As, Cd, Cr, Cu, Pb, Ni, Zn, OCP, OPP
HS7	Sheep footbath	0-100	As, Cd, Cr, Cu, Pb, Ni, Zn, OCP, OPP
HS8	Sheep footbath	0-100	As, Cd, Cr, Cu, Pb, Ni, Zn, OCP, OPP
HS9	Cattle crush	0-100	As, Cd, Cr, Cu, Pb, Ni, Zn, OCP, OPP
HS10	Sheep footbath sump	0-100	As, Cd, Cr, Cu, Pb, Ni, Zn, OCP, OPP

9.3 Sampling methods

Soil samples were taken using a stainless steel trowel. Soil was taken at each individual sampling location below the vegetative and detrital layer.

The soil was transferred to a solvent rinsed glass jar with a Teflon lid.

Tools were decontaminated between sampling locations to prevent cross contamination by: brushing to remove caked or encrusted material, rinsing with clean tap water and allowing to air dry or using a clean towel.

The sample log including schedule of analysis is presented in Appendix 3.

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.

Soil samples were collected across the general site on a probabilistic pattern of 100 metres. This sampling density will enable the detection of an area with an elevated concentration on a radius of 60 metres across the site with a 95% confidence level.

The number of sampling locations is less than the recommended density in the EPA sampling guidelines but expected to be sufficient based on historical land-use.

A judgemental sampling pattern was adopted to assess AEC.

10.2 Field

The collection of samples was undertaken in accordance with accepted standard protocols (NEPC 1999). Soil samples collected from the general site were analysed for heavy metals.

Soil samples collected from potential AEC were analysed for selected potential contaminants including heavy metals, OCP, OPP, TRH, BTEXN and PAH.

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 trowel, corer or auger tip. After collection the samples were immediately placed in new glass sampling jars and placed in a cooler.

Three 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 laboratory has 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.

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

The main reference for environmental site assessment in Australia is the ASC NEPM (NEPC 1999 rev 2013). This document includes criteria for use in evaluating potential risk to human health and ecosystems from chemical impacts, which are presented as generic investigation levels and screening levels appropriate to a Tier 1 risk-based assessment applicable for site assessment. The application of these investigation levels and screening levels is subject to a range of limitations, and their selection and use must be in the context of a conceptual site model (CSM) relating to the nature and distribution of impacts and potential exposure pathways.

The proposed land-use is residential and appropriate initial criteria are described in *Guideline on Investigation Levels for Soil and Groundwater* (NEPC 1999).

The criteria lists health investigation levels (HIL) for a range of land-uses. The appropriate initial comparison for the site is residential (HIL A).

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 5. 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 30meq/100g, clay content of 30%, pH values of 5.5 and organic carbon of 5% (eSPADE 2023). The contaminants have been identified in the soil for at least two years and are considered aged. The ASC NEPM EIL calculation spreadsheet was used to determine the EIL. Default values for ambient background concentrations were adopted. EILs vary with land-use and apply to contaminants up to 2m in depth below the surface. The EILs for residential land-use are listed in Table 4.

Table 4. EIL Calculation sheet, residential land-use

Analyte	Rationale	EIL (mg/kg)
Arsenic	Generic	100
Chromium (III)	Clay content 30%	580
Copper	CEC 30meq/100g, pH 5.5, organic carbon 5%	150
Lead	Generic	1,100
Nickel	CEC 30meq/100g	350
Zinc	CEC 30meq/100g, pH 5.5	350
Naphthalene	Generic	170
DDT	Generic	180

Management limits have been developed to assess petroleum hydrocarbons following evaluation of human health and ecological risks (NEPC 1999). Management limits are applicable as screening levels after consideration of relevant ESLs and HSLs. The appropriate management limit for the site is listed in Table 5.

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).

Table 5. Assessment criteria

Analyte	HIL A	Residential HSL clay soil, 0m to <1m	Residential EIL	Residential ESL fine soil	Management limits - Residential
Arsenic	100	-	100	-	-
Cadmium	20	-	-	-	-
Chromium	100[1]	-	580[2]	-	-
Copper	6,000	-	150	-	-
Lead	300	-	1,100	-	-
Nickel	400	-	350	-	-
Zinc	7,400	-	350	-	-
Mercury	40	-	-	-	-
OCP	-	-	-	-	-
OPP	-	-	-	-	-
DD's	240	-	-	-	-
DDT	-	-	180	-	-
Aldrin and dieldrin	6	-	-	-	-
F1 (TRH C6-10)	-	50	-	180	800
F2 (TRH C10-16)	-	280	-	120	1,000
F3 (TRH C16-34)	-	-	-	1,300	3,500
F4 (TRH C34-40)	-	-	-	5,600	10,000
Benzene	-	0.7	-	65	-
Toluene	-	480	-	105	-
Ethylbenzene	-	NL	-	125	-
Xylenes	-	110	-	45	-
Naphthalene	-	5	170	-	-
Benzo(a)pyrene	-	-	-	0.7	-
Carcinogenic PAH	3	-	-	-	-
PAH (Total)	300	-	-	-	-

HIL – health investigation levels, HSL – health screening level, EIL – ecological investigation levels, ESL – ecological screening level, NL – non limiting, NA – not applicable, [1] Threshold for Chromium (VI), [2] Threshold for Chromium (III)

12. Results and discussion

12.1 Site inspection

The site is currently used to graze sheep and has been divided into paddocks with five dams. A dwelling is located in the central southern section of the site. The dwelling is located on proposed Lot 7. Land-use on Lot 7 will not change and therefore does not require assessment.

Infrastructure associated with the agricultural enterprise is present in the southern section of the site. Infrastructure includes two hay sheds (Sheds A and B), a workshop (Shed C), cattle yards and dilapidated sheep yards. An AST was identified on the north western corner of Shed B. A sheep footbath and associated sump was identified to the south of Shed B. Two spray carts were identified to the north and east of Shed B. Areas around Sheds B and C were being used for storage of foreign materials including metal, wire, bricks, drums, welding unit, farm machinery, tiles, tyres, ag pipe, hose drums and buoys. No asbestos containing materials were identified in the storage areas. Sheds B and C, associated infrastructure and stored materials will be located outside the building envelopes proposed as part of the subdivision.

12.2 Analytical results

12.2.1 General site

Levels of total chromium exceeded the chromium (VI) the health investigation level in one sample (SP16) (Table 6). Analysis of the sample for chromium (VI) identified levels of chromium (VI) below the laboratory

detection limits indicating the chromium predominantly comprised chromium (III). Levels of chromium (III) were below the ecological investigation level (Table 6).

Levels of other heavy metals were less than the adopted HIL and EIL (Table 6).

Table 6. Summary of analytical results and threshold concentrations (general site) (mg/kg)

Sample ID	Arsenic	Cadmium	Chromium (total)	Chromium (VI)	Copper	Lead	Nickel	Zinc
SP1	15	<0.3	78	-	67	50	16	120
SP2	1	<0.3	9.2	-	8.2	6	3.2	17
SP3	1	<0.3	10	-	6.4	5	2.3	13
SP4	1	<0.3	7.7	-	6.5	7	2.0	9.5
SP5	<1	<0.3	6.2	-	4.2	4	1.2	6.2
SP6	1	<0.3	7.3	-	5.2	6	1.5	7.4
SP7	<1	<0.3	8.3	-	4.7	5	1.5	7.2
SP8	<1	<0.3	7.0	-	5.1	5	1.4	7.1
SP9	<1	<0.3	6.2	-	4.4	6	1.2	7.9
SP10	1	<0.3	11	-	5.9	6	2.2	7.7
SP11	2	<0.3	33	-	7.6	9	4.8	12
SP12	1	<0.3	7.9	-	5.8	5	1.8	7.9
SP13	<1	<0.3	7.1	-	5.1	4	1.5	8.6
SP14	<1	<0.3	16	-	5.8	6	2.0	7.6
SP15	2	<0.3	20	-	10	8	4.6	17
SP16	2	<0.3	**110**	<0.5	12	11	7.8	19
SP17	2	<0.3	72	-	11	10	7.1	19
SP18	2	<0.3	52	-	8.6	10	4.6	21
SP19	1	<0.3	21	-	5.3	6	2.1	8.3
SP20	2	<0.3	14[1]	-	7.6	6	3.2	15
SP21	3	<0.3	40	-	6.7	9	2.8	13
SP22	2	<0.3	29	-	8.6	9	4.0	15
SP23	2	<0.3	93	-	11	9	7.4	18
Average	2	-	31.6	-	9.8	8.8	3.6	16.9
95% UCL	3.2	-	47.3	-	15.0	12.5	5.0	26.3
Health Investigation Levels – Residential land-use threshold (NEPC 1999)								
	100	*20*	*100[1]*	*100*	*6,000*	*300*	*400*	*7,400*
Ecological Investigation Levels – Residential land-use threshold (NEPC 1999)								
	100	*-*	*580[2]*	*-*	*150*	*1,100*	*350*	*350*

[1] Threshold for Chromium (VI), [2] Threshold for Chromium (III), [1] Result of duplicate sample

12.2.2 Potential areas of environmental concern

Potential areas of environmental concern were identified around infrastructure in the southern section of the site. The AEC are located on proposed Lot 7 and outside the proposed building envelope on Lot 9.

Visual soil staining was not identified around the base of the AST. Levels of potential contaminants in sample HS1 collected from the base were below adopted thresholds (Tables 7 and 9).

The spray carts appeared to have been stored in the current locations since 2020. Bare areas were identified beneath the spray carts. Levels of zinc in the samples collected from spray carts (HS2 and

HS3) exceeded the EIL for zinc (Table 7). Levels of other metals were below adopted thresholds (Table 7). OCP were detected in the samples at levels less than adopted thresholds (Table 8).

Levels of zinc in the sample collected from a downslope area adjacent Shed C (HS4) exceeded the adopted EIL (Table 6). Levels of other metals were below adopted thresholds (Table 6). TRH (C16-C40) were detected in the sample at levels less than the adopted thresholds (Table 8).

Levels of zinc in the sample collected from the drum store area south of Shed B (HS5) exceeded the adopted EIL (Table 6). Levels of other metals were below adopted thresholds (Table 6). Levels of carcinogenic PAH exceeded the adopted HIL and levels of benzo(a)pyrene exceeded the adopted EIL in sample HS5 (Table 8).

The sheep footbath is characterized by grooved concrete slab surrounded by a low fence. The footbath sump is located towards the southern end of the footbath and has been covered with sleepers. The sump was unable to be inspected. Samples collected adjacent the footbath and sump (HS6, HS7, HS8 and HS10) contained levels of potentially contaminants less than adopted thresholds (Table 4 and 5).

Levels of potential contaminants in sample HS9 collected from the soil beneath the cattle crush contained levels of potential contaminants below adopted thresholds (Tables 4 and 5).

Table 7. Analytical results and threshold concentrations (areas of environmental concern) - heavy metals (mg/kg)

Sample ID	Location	Arsenic	Cadmium	Chromium (total)	Copper	Lead	Nickel	Zinc	Mercury
HS1	Downslope of AST	-	-	-	-	20	-	-	-
HS2	Spray cart 1	4	2.1	24	21	70	7.9	**1,900**	-
HS3	Spray cart 2	5[1]	1.1[1]	29[1]	47	140[1]	8.6[1]	**970**	-
HS4	Downslope of workshop	3	0.6	18	57	120	8.8	**7,300**	<0.05
HS5	Drum store south of hay shed	5	0.5	26	53	56	7.7	**730**	0.28
HS6	Sheep footbath	2	<0.3	32	12	15	7.5	100	-
HS7	Sheep footbath	2	<0.3	28	15	11	6.7	150	-
HS8	Sheep footbath	3	<0.3	67	16	16	6.1	140	-
HS9	Stock crush	19	<0.3	50	64	4	22	59	-
HS10	Sheep footbath sump	2	<0.3	31	17	30	10	150	-
Health Investigation Levels – Residential land-use threshold (NEPC 1999)									
		100	*20*	*100[1]*	*6,000*	*300*	*400*	*7,400*	*40*
Ecological Investigation Levels – Residential land-use threshold (NEPC 1999)									
		100	*-*	*580[2]*	*150*	*1,100*	*350*	*350*	*-*

[1] Threshold for Chromium (VI), [2] Threshold for Chromium (III), [1] Result of duplicate sample

Table 8. Analytical results and threshold concentrations (areas of environmental concern) - pesticides (mg/kg)

Sample ID	Location	OCP	DDs	DDT	Aldrin and dieldrin	OPP
HS2	Spray cart 1	30	30	15.4	<0.3	<1.7
HS3	Spray cart 2	2	1.5	0.7	0.4	<1.7
HS6	Sheep footbath	<1	<0.1	<0.1	<0.3	<1.7
HS7	Sheep footbath	<1	<0.1	<0.1	<0.3	<1.7
HS8	Sheep footbath	<1	<0.1	<0.1	0.4	<1.7
HS9	Stock crush	<1	<0.1	<0.1	<0.3	<1.7
HS10	Sheep footbath sump	<1	<0.1	<0.1	<0.3	<1.7
Health Investigation Levels – Residential land-use threshold (NEPC 1999)						
		-	*240*	*-*	*6*	*-*
Ecological Investigation Levels – Residential land-use threshold (NEPC 1999)						
		-	*-*	*180*	*-*	*-*

Table 9. Soil analysis results (areas of environmental concern) – hydrocarbons (mg/kg)

Sample I.D	Location Depth (mm)	TRH (C6-C10)	TRH (C10-C16)	TRH (C16-C34)	TRH (C34-C40)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PAH	Carcinogenic PAH	Benzo(a)pyrene
HS1	Downslope of AST	<25	<25	140	<120	<0.1	<0.1	<0.1	<0.3	<0.1	<0.8	<0.3	<0.1
HS4	Downslope of workshop	<25	<25	1,300	270	<0.1	<0.1	<0.1	<0.3	<0.1	<0.8	<0.3	<0.1
HS5	Drum store south of hay shed	<25	<25	550	<120	<0.1	<0.1	<0.1	<0.3	<0.1	37	**4.1**	**2.7**
HIL – Residential		-	-	**-**	-	-	-	-	-	-	300	3	-
HSL – Residential clay soil	0 to <1m	50	280	-	-	0.7	480	NL	NL	5	-	-	-
EIL – Residential		-	-	-	-	-	-	-	-	170	-	-	-
ESL – Residential		180	120	1,300	5,600	65	105	125	45	-	-	-	0.7
Management limits – Residential		800	1,000	3,500	10,000	-	-	-	-	-	-	-	-

ND – not detected, NL – Not limiting, HIL – health investigation levels, HSL – health screening level, EIL – ecological investigation level, ESL – ecological screening level

13. Site characterisation

13.1 Environmental contamination

Levels of zinc exceeding the EIL was identified around the spray carts, Shed C and drum store south of Shed B. The zinc is suspected to be from pesticides stored in the area or leaching of building materials. Extent of impact has is not known.

Levels of carcinogenic PAH exceeded the HIL and levels of benzo(a)pyrene exceeded the EIL in the drum store area south of Shed B. Source of the contamination is not known. Extent of impact is not known.

Foreign material storage areas are south of Shed B and around Shed C. The foreign material is considered an amenity issue.

13.2 Chemical degradation production

Zinc and foreign materials do not degrade.

Carcinogenic PAH and benzo(a)pyrene degrade very slowly.

13.3 Exposed population

13.3.1 Human health

Levels of carcinogenic PAH exceeding the HIL were identified south of Shed B. Direct contact may affect sensitive receptors. Direct contact by people is unlikely as the area is not currently occupied. The area is located outside proposed building envelopes and is unlikely to be routinely used by people occupying the site.

The foreign materials are an amenity issue.

13.3.2 Environment

Localised impacts on the environment may occur from the areas of environment concern containing zinc and benzo(a)pyrene. Bare areas were identified in the vicinity of the zinc impacted soil beneath the spray carts. No other impacts on vegetation were identified at impacted areas. Local vegetation is expected to be adapted to the high background levels of metals.

The impacts are not expected to extend off-site or impact on groundwater.

14. Conclusions and recommendations

14.1 Summary

An inspection of the site was undertaken on 1 March 2023. The site is agricultural land used for the grazing of sheep. Agricultural infrastructure is present in the southern section of the site on proposed Lots 7 and 9 including two hay sheds (Sheds A and B), a workshop (Shed C), cattle yards, dilapidated sheep yards and a sheep footbath. Two spray carts and an AST are also present in the area. Storage of foreign materials occurs to the south of Shed B and around Shed C.

Vegetation across the site was generally 100% and included pasture grasses and broadleaved weeds. Gravel hardstand was present as tracks around the sheds and within the cattleyards. Bare areas were present beneath the spray carts.

Soil samples were collected across the paddocks at the 0 to 100mm soil depth. Soil samples were collected around areas of environmental concern from the 0 to 100 and 50 to 150mm soil depth to provide a preliminary assessment of potential contamination outside proposed building envelopes.

Levels of potential contaminants throughout the paddocks and within nominated building envelopes were less than the adopted thresholds.

Elevated levels of zinc exceeding the ecological investigation levels were identified around the spray carts, Shed C and the drum store south of Shed B. Elevated levels of PAH exceeding the health and ecological investigation levels were identified south of Shed B. The locations are outside proposed building envelopes. The identified contamination has not been delineated.

Storage of foreign materials south of Shed B and around Shed C is an amenity issue.

Detailed investigations around areas of infrastructure are required to ensure all areas of contamination have been identified. The further investigations should include delineation of known contamination to enable remediation to be undertaken.

The proposed building envelopes are suitable for residential land-use. Areas outside building envelopes require remediation.

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 59 metres and with a 95% level of confidence.

Investigations around areas of infrastructure was preliminary. Number of samples collected was considered sufficient to provide a preliminary indication of contamination but not sufficient to enable full characterisation.

14.4 Suitability for proposed use of the site

The proposed building envelopes are suitable for residential land-use. Areas outside building envelopes require further investigation and remediation.

14.5 Limitations and constraints on the use of the site

No constraints are recommended.

14.6 Recommendation for further work

Decommissioning of the infrastructure is likely to occur following subdivision. A detailed investigation should be undertaken around the infrastructure prior to decommissioning to enable identification of all areas of contamination. The detailed investigation should include delineation of identified contamination and additional sampling and analysis to increase confidence in results.

Remediation of the identified contamination is required to be undertaken in accordance with a remedial action plan (RAP).

An unidentified finds procedure should be adopted for site development works (Appendix 6).

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.

16. References

Environment Protection Authority (2020) *Consultants Reporting on Contaminated Land* (NSW Environment Protection Authority, Chatswood)

EPA (2017) *Contaminated Sites: Guidelines for the NSW Site Auditors Scheme* (NSW Department of Environment and Conservation, Chatswood)

EPA (2022) *Sampling design part 1 – application* (NSW Environment Protection Authority, Parramatta)

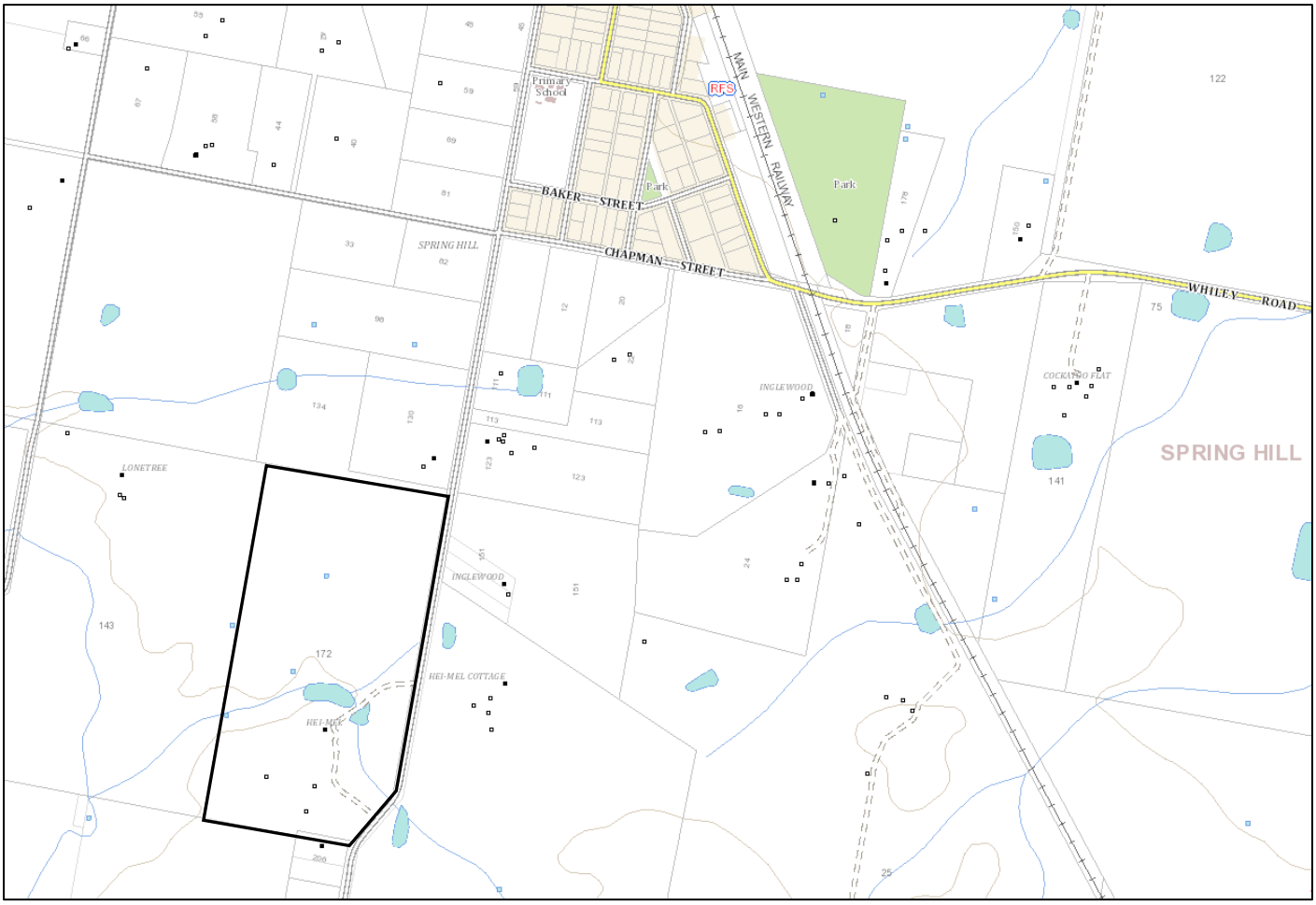
NEPC (1999 revised 2013) *National Environment Protection (Assessment of Site Contamination) Measure 1999* (National Environment Protection Council Service Corporation, Adelaide)

NSW Government (nd) *eSpadev2* (https://www.environment.nsw.gov.au/eSpade2WebApp)

NSW Government (2023) *Naturally occurring asbestos* (datasets.seed.nsw.gov.au/dataset/naturally-occurring-asbestos)

NSW Government (2023) *Acid sulphate soils* (datasets.seed.nsw.gov.au/dataset/ acid-sulfate-soils-risk0196c)

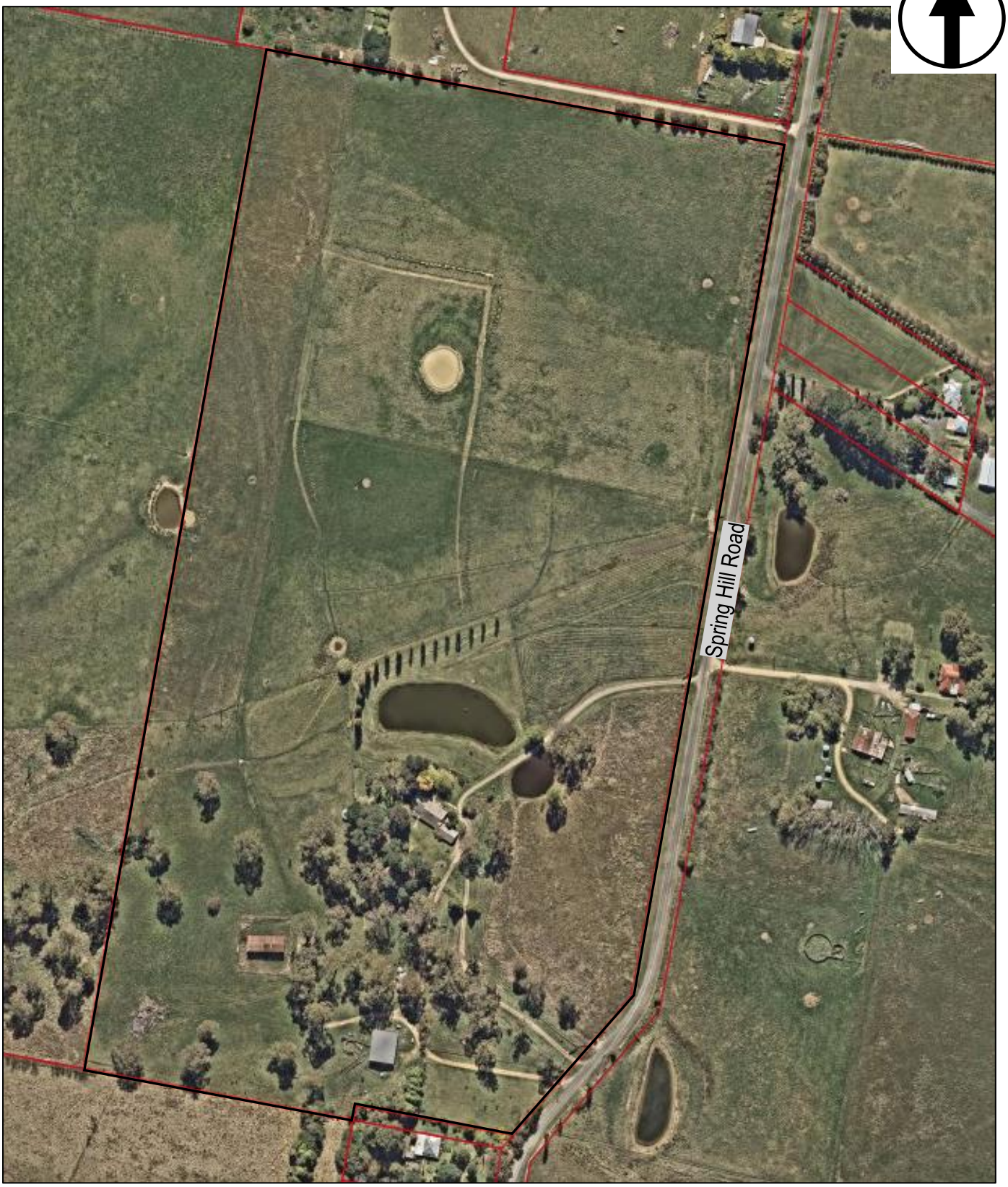
Figures



Legend

Investigation area

Figure 1. Locality map		
172 Spring Hill Road, Spring Hill		
	Envirowest Consulting Pty Ltd	
Job: R14501c	Drawn by: LD	Date: 27/4/2023



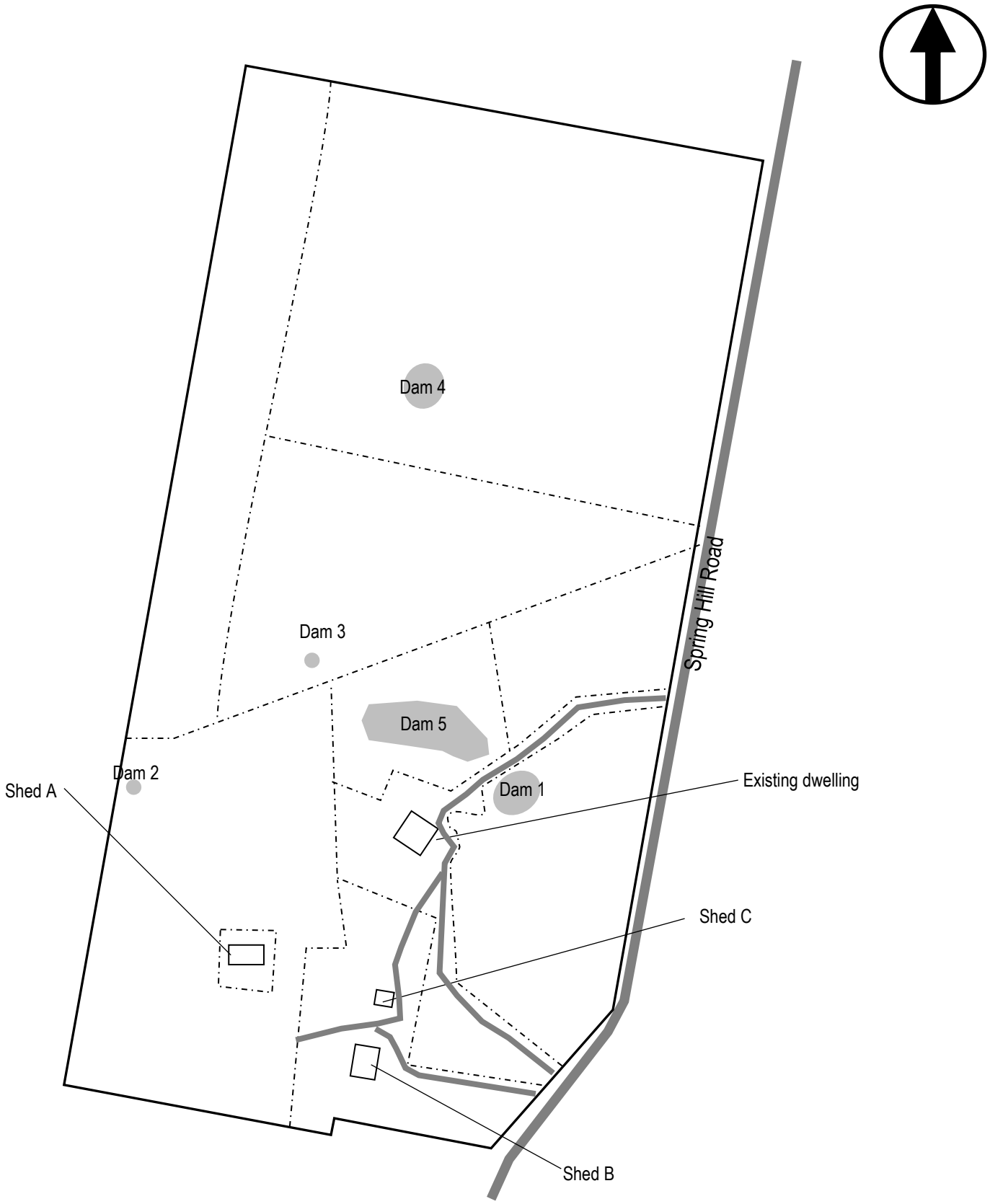
Legend

Investigation area

Approximate Scale 1: 3,550

0 71 142m

Figure 2. Aerial image (2023)		
172 Spring Hill Road, Spring Hill		
	Envirowest Consulting Pty Ltd	
Job: R14501c	Drawn by: LD	Date: 27/4/2023



Legend

- Investigation area
- Fence
- Track
- Dam
- Existing structure

Approximate Scale 1: 3,550

0 71 142m

Figure 3. Site plan

172 Spring Hill Road, Spring Hill

Envirowest Consulting Pty Ltd

Job: R14501c	Drawn by: LD	Date: 27/4/2023

Legend

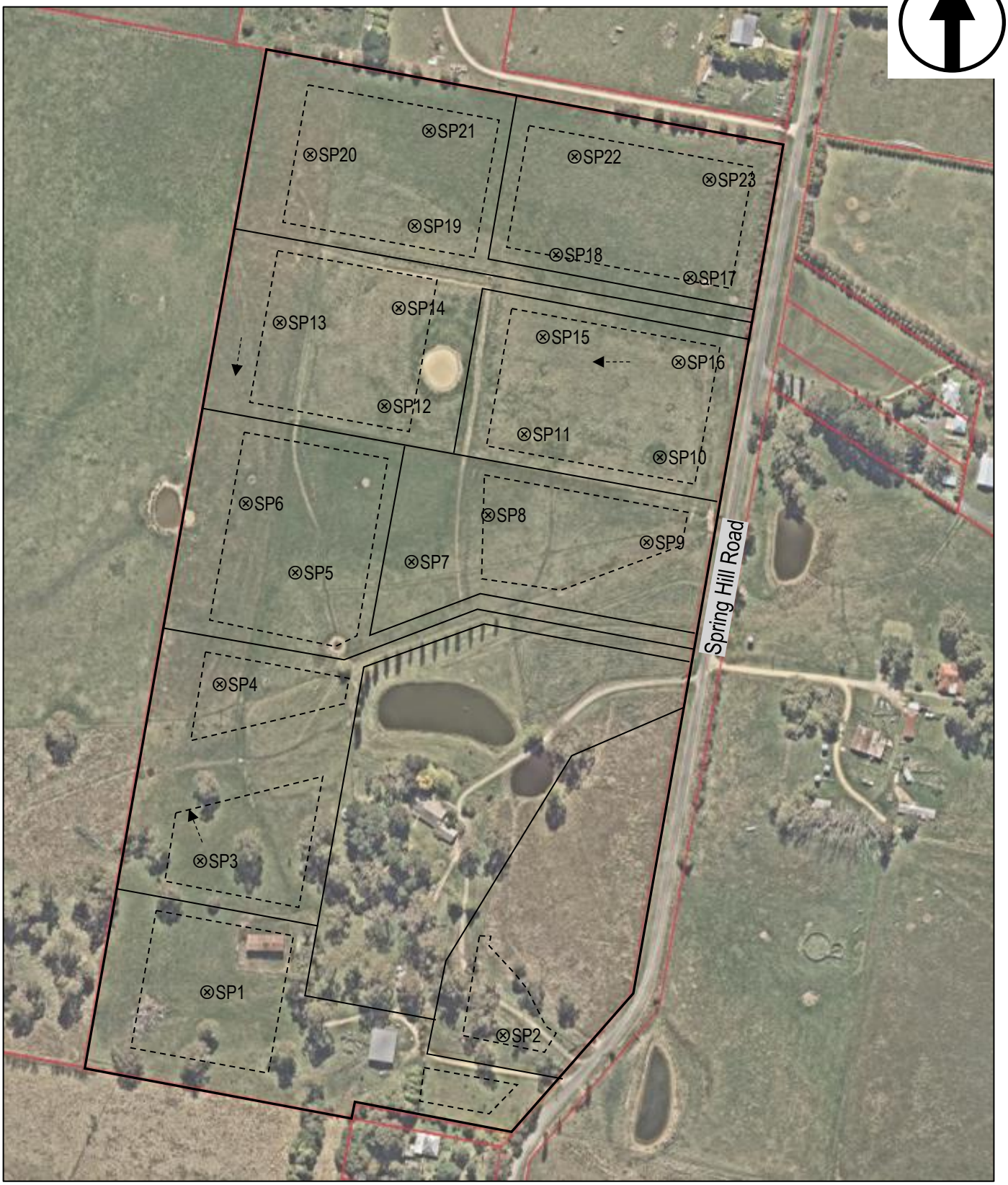
— Investigation area

---► Slope

Approximate Scale 1: 400

0 4 8 16m

Figure 4. Site plan of infrastructure		
172 Spring Hill Road, Spring Hill		
	Envirowest Consulting Pty Ltd	
Job: R14501c	Drawn by: LD	Date: 27/4/2023



Legend

- Investigation area
- Slope
- Sampling locations
- Proposed lot boundaries
- Proposed building envelopes

Approximate Scale 1: 3,550

0 71 142m

Figure 5. Paddock sampling locations

172 Spring Hill Road, Spring Hill

Envirowest Consulting Pty Ltd

Job: R14501c	Drawn by: LD	Date: 27/4/2023

Legend

— Investigation area

⇢ Slope

⊗ Sampling locations

Approximate Scale 1: 400

0 4 8 16m

Figure 6. Areas of environmental concern sampling locations		
172 Spring Hill Road, Spring Hill		
	Envirowest Consulting Pty Ltd	
Job: R14501c	Drawn by: LD	Date: 27/4/2023

Legend

— Investigation area

---▶ Slope

⊗ Sampling locations

Approximate Scale 1: 400

0 4 8 16m

Figure 7. Exceedences		
172 Spring Hill Road, Spring Hill		
	Envirowest Consulting Pty Ltd	
Job: R14501c	Drawn by: LD	Date: 27/4/2023

Figure 8. Photographs of the site

General site

General site

General site

Shed A

Shed B

Shed B and AST

Spray cart 2

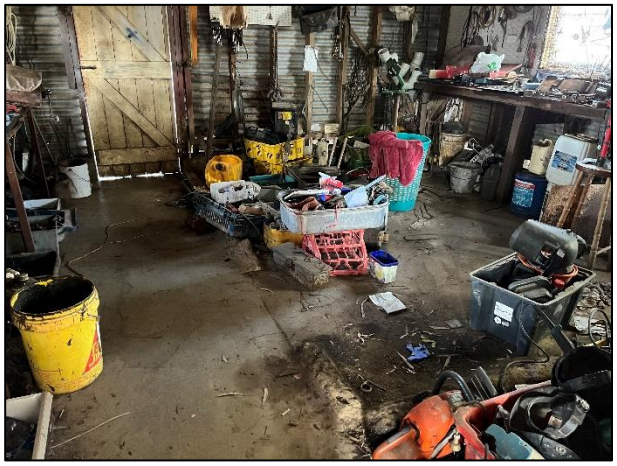
Drum store area south of Shed B

Footbath

Footbath sump

Storage area south east of Shed B

Storage area south east of Shed B



Internal area of Shed C

Internal area of Shed C

Storage area west of Shed C

Battery storage area at Shed C

Appendices

Appendix 1. 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 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, TRH, BTEXN, PAH 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 NEPM (1999) 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 against the adopted criteria of 30%.

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.
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 30%

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

One analysis batch was undertaken over the preliminary investigation program. Samples were collected on 1 March 2023. A total of 33 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 (NEPC 1999). Chain of custody forms accompanied transport of the samples to the laboratory.

The samples were analysed at the laboratories of SGS, Alexandria, NSW which are 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
SP1, SP2, SP3, SP4, SP5, SP6, SP7, SP8, SP9, SP10, SP11, SP12, SP13, SP14, SP15, SP17, SP18, SP19, SP20, SP21, SP22, SP23	23	2	As, Cd, Cr, Cu, Pb, Ni, Zn	1/3/2023	Soil	SE243929
HS1	1	0	TRH, BTEXN, PAH, lead	1/3/2023	Soil	SE243929
HS2, HS3, HS6, HS7, HS8, HS9, HS10	7	1	As, Cd, Cr, Cu, Pb, Ni, Zn, OCP, OPP,	1/3/2023	Soil	SE243929
HS4, HS5	2	0	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH (C6-C40), BTEXN, PAH	1/3/2023	Soil	SE243929
SP16	1	0	As, Cd, Cr, Cr (VI), Cu, Pb, Ni, Zn	1/3/2023	Soil	SE243929A

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
TPH(C6-C9)	USPEA SW846-5030A	USPEA SW 846-8260B
TPH(C10-C36), PAH	Tumbler extraction of solids	USEPA SW 846-8270B
PCB	Tumbler extraction of solids	USEPA SW 846-8270B
OC/OP Pesticides	Tumbler extraction of solids	USEPA SW 846-8270B
BTEX	Tumbler extraction of solids	USEPA SW 846-8260B

3. Field quality assurance and quality control

Three intra laboratory duplicate sample was collected for the investigation. The frequency was 9% which is greater than the recommended frequency. 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 +/- 30% 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
SP1, SP2, SP3, SP4, SP5, SP6, SP7, SP8, SP9, SP10, SP11, SP12, SP13, SP14, SP15, SP16, SP17, SP18, SP19, SP20, SP21, SP22, SP23, HS1, HS2, HS3, HS4, HS5, HS6, HS7, HS8, HS9, HS10	33	3	9	1/3/2023	Soil	SE243929, SE243929A

Table A1. Relative differences for intra laboratory duplicates

	HS3	DA1	Relative difference (%)	Pass/Fail	SP3	DA2	Relative difference (%)	Pass/Fail
Arsenic	4	5	22	Pass	1	<1	-	Pass
Cadmium	1.0	1.1	10	Pass	<0.3	<0.3	-	Pass
Chromium (total)	27	29	7	Pass	10	7.5	29	Pass
Copper	47	45	4	Pass	6.4	4.3	39	Fail
Lead	130	140	7	Pass	5	5	0	Pass
Nickel	8.1	8.6	6	Pass	2.3	1.6	36	Pass*
Zinc	970	930	4	Pass	13	12	8	Pass

NA – relative difference unable to be calculated as results are less than laboratory detection limit, * results less than 5 times laboratory detection limits

	SP20	DA3	Relative difference (%)	Pass/Fail
Arsenic	2	1	67	Pass
Cadmium	<0.3	<0.3	-	Pass
Chromium (total)	13	14	7	Pass
Copper	7.6	7.1	7	Pass
Lead	6	6	0	Pass
Nickel	3.2	3.0	6	Pass
Zinc	15	14	7	Pass

NA – relative difference unable to be calculated as results are less than laboratory detection limit, * results less than 5 times laboratory detection limits

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 NEPC (1999). The time between collection and extraction for all samples was less than the criteria listed below:

Analyte	Maximum holding time
Metals, cyanide	6 months
OCP, OPP, TRH, BTEXN, PAH	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. No significant outliers exist for the sampling batches. 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) analysis

5.1 Completeness

A measure of the amount of usable data for a data collection activity (total to be greater than 95%).

The data set was found to be complete based on the scope of work. No critical areas of contamination were omitted from the data set.

5.1.1 Field

Consideration	Accepted	Comment
Locations to be sampled	Yes	In accordance with sampling methodology, described in the report. Sampling locations described in figures.
Depth to be sampled	Yes	In accordance with sampling methodology
SOP appropriate and compiled	Yes	In accordance with sampling methodology Sampled with a stainless-steel push corer and trowel into lab prepared containers, decontamination between samples, latex gloves worn by sampler
Experienced sampler	Yes	Same soil sampler, environmental scientist
Documentation correct	Yes	Sampling log completed Chain of custody completed

5.1.2 Laboratory

Consideration	Accepted	Comment
Samples analysed	Yes	All critical samples analysed in accordance with chain of custody and analysis plan
Analytes	Yes	All analytes 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 report for each batch
Sample holding times	Yes	Metals less than 6 months. OCP, OPP, PAH, BTEXN, TRH 14 days.

5.2 Comparability

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

5.2.1 Field

Consideration	Accepted	Comment
SOP	Yes	Same sampling procedures used and sampled on one date
Experienced sampler	Yes	Experienced scientist
Climatic conditions	Yes	Described in field sampling log
Samples collected	Yes	Suitable size, storage and transport

5.2.2 Laboratory

Consideration	Accepted	Comment
Analytical methods	Yes	Same methods all samples, in accordance with NEPC (1999) or USEPA
PQL	Yes	Suitable for analytes
Same laboratory	Yes	SGS is NATA accredited for the tests undertaken
Same units	Yes	-

5.3 Representativeness

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

The data sets were found to be acceptable.

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. No blanks analysed. 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).

The data sets were found to be acceptable.

5.4.1 Field

Consideration	Accepted	Comment
SOP	Yes	Complied
Field duplicates	Yes	Collected

5.4.2 Laboratory

Consideration	Accepted	Comment
Laboratory and inter lab duplicates	Yes	Frequency of 5%, results to be within +/-30% or discussion required.
Field duplicates	Yes	Frequency of 5%, results to be within +/-30% or discussion required.
Laboratory prepared volatile trip spikes	NA	Not collected due to the preliminary nature of the investigation.

5.5 Accuracy

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

The data sets were found to be acceptable.

5.5.1 Field

Consideration	Accepted	Comment
SOP	Yes	Complied
Field blanks	NA	Frequency of 5%, <5 times the PQL, PQL may be adjusted
Rinsate blanks	NA	Frequency of 5%, <5 times the PQL, PQL may be adjusted

5.5.2 Laboratory

Consideration	Accepted	Comment
Method blanks	Yes	Frequency of 5%, <5 times the PQL, PQL may be adjusted
Matrix spikes	Yes	Frequency of 5%, results to be within +/-40% or discussion required.
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

Sampling log

Client	Susan Stewart
Contact	Iplan Projects Andrew Napier
Job number	14501
Location	172 Spring Hill Road Spring Hill NSW
Date	1 March 2023
Investigator	Leah Desborough
Weather conditions	Warm and fine

Sample ID	Matrix	Date	Analysis required	Observations/comments
SP1	Soil	1/3/2023	Arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), Nickel (Ni), zinc (Zn)	
SP2	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	
SP3	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	
SP4	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	
SP5	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	
SP6	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	
SP7	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	
SP8	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	
SP9	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	
SP10	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	
SP11	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	
SP12	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	
SP13	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	
SP14	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	
SP15	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	
SP16	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn, Cr (VI)	
SP17	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	
SP18	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	
SP19	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	
SP20	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	
SP21	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	
SP22	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	
SP23	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	
HS1	Soil	1/3/2023	Total recoverable hydrocarbons (TRH (C6-C40)), benzene, toluene, ethylbenzene, xylenes, naphthalene (BTEXN), polycyclic aromatic hydrocarbons (PAH), lead	
HS2	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn, organochlorine pesticides (OCP), organophosphorus pesticides (OPP)	
HS3	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn, OCP, OPP	
HS4	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH, BTEXN, PAH	
HS5	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn, Hg, TRH, BTEXN, PAH	
HS6	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn, OCP, OPP	
HS7	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn, OCP, OPP	
HS8	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn, OCP, OPP	
HS9	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn, OCP, OPP	
HS10	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn, OCP, OPP	
DA1	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	Duplicate of HS3
DA2	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	Duplicate of SP3
DA3	Soil	1/3/2023	As, Cd, Cr, Cu, Pb, Ni, Zn	Duplicate of SP20

Appendix 4. Soil analysis results – SGS report number SE243929, SE243929A and chain of custody forms

ANALYTICAL REPORT

Accreditation No. 2562

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	**14501**
Order Number	**14501**
Samples	36

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	**SE243929 R0**
Date Received	3/3/2023
Date Reported	10/3/2023

COMMENTS

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

SIGNATORIES

Akheeqar BENIAMEEN
Chemist

Bennet LO
Senior Chemist

Dong LIANG
Metals/Inorganics Team Leader

Huong CRAWFORD
Production Manager

Ly Kim HA
Organic Section Head

Shane MCDERMOTT
Inorganic/Metals Chemist

VOC's in Soil [AN433] Tested: 3/3/2023

PARAMETER	UOM	LOR	HS1 SOIL - 1/3/23 12:00 SE243929.024	HS4 SOIL - 1/3/23 12:00 SE243929.027	HS5 SOIL - 1/3/23 12:00 SE243929.028
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1
Total Xylenes*	mg/kg	0.3	<0.3	<0.3	<0.3
Total BTEX*	mg/kg	0.6	<0.6	<0.6	<0.6
Naphthalene (VOC)*	mg/kg	0.1	<0.1	<0.1	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 3/3/2023

PARAMETER	UOM	LOR	HS1 SOIL - 1/3/23 12:00 SE243929.024	HS4 SOIL - 1/3/23 12:00 SE243929.027	HS5 SOIL - 1/3/23 12:00 SE243929.028
TRH C6-C9	mg/kg	20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 3/3/2023

PARAMETER	UOM	LOR	HS1 SOIL - 1/3/23 12:00 SE243929.024	HS4 SOIL - 1/3/23 12:00 SE243929.027	HS5 SOIL - 1/3/23 12:00 SE243929.028
TRH C10-C14	mg/kg	20	<20	420	33
TRH C15-C28	mg/kg	45	76	920	350
TRH C29-C36	mg/kg	45	79	780	280
TRH C37-C40	mg/kg	100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	590	52
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	590	52
TRH >C16-C34 (F3)	mg/kg	90	140	1300	550
TRH >C34-C40 (F4)	mg/kg	120	<120	270	<120
TRH C10-C36 Total	mg/kg	110	150	2100	660
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	2200	610

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 3/3/2023

PARAMETER	UOM	LOR	HS1 SOIL - 1/3/23 12:00 SE243929.024	HS4 SOIL - 1/3/23 12:00 SE243929.027	HS5 SOIL - 1/3/23 12:00 SE243929.028
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	**0.2**
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	**0.2**
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	**0.9**
Fluorene	mg/kg	0.1	<0.1	<0.1	**0.5**
Phenanthrene	mg/kg	0.1	<0.1	<0.1	**5.9**
Anthracene	mg/kg	0.1	<0.1	<0.1	**1.4**
Fluoranthene	mg/kg	0.1	<0.1	<0.1	**5.7**
Pyrene	mg/kg	0.1	<0.1	<0.1	**5.4**
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	**4.2**
Chrysene	mg/kg	0.1	<0.1	<0.1	**3.4**
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	**0.2**	**3.2**
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	**0.2**	**1.2**
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	**2.7**
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	**1.3**
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	**0.3**
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	**0.9**
Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ (mg/kg)	0.2	<0.2	<0.2	**4.1**
Carcinogenic PAHs, BaP TEQ <LOR=LOR*	TEQ (mg/kg)	0.3	<0.3	<0.3	**4.1**
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	<0.2	<0.2	**4.1**
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	**37**
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	**37**

OC Pesticides in Soil [AN420] Tested: 3/3/2023

PARAMETER	UOM	LOR	HS2 SOIL - 1/3/23 12:00 SE243929.025	HS3 SOIL - 1/3/23 12:00 SE243929.026	HS6 SOIL - 1/3/23 12:00 SE243929.029	HS7 SOIL - 1/3/23 12:00 SE243929.030	HS8 SOIL - 1/3/23 12:00 SE243929.031
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 (gamma BHC)	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	**15**	**0.8**	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	**0.4**	<0.2	<0.2	**0.4**
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD*	mg/kg	0.1	**0.5**	<0.1	<0.1	<0.1	<0.1
o,p'-DDT*	mg/kg	0.1	**3.4**	**0.2**	<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	**12**	**0.5**	<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	**30**	**2**	<1	<1	<1
Total OC VIC EPA	mg/kg	1	**27**	**2**	<1	<1	<1

OC Pesticides in Soil [AN420] Tested: 3/3/2023 (continued)

PARAMETER	UOM	LOR	HS9 SOIL - 1/3/23 12:00 SE243929.032	HS10 SOIL - 1/3/23 12:00 SE243929.033
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1
Lindane (gamma BHC)	mg/kg	0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1
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
Endrin	mg/kg	0.2	<0.2	<0.2
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	<0.1	<0.1
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	<1	<1
Total OC VIC EPA	mg/kg	1	<1	<1

OP Pesticides in Soil [AN420] Tested: 3/3/2023

PARAMETER	UOM	LOR	HS2 SOIL - 1/3/23 12:00 SE243929.025	HS3 SOIL - 1/3/23 12:00 SE243929.026	HS6 SOIL - 1/3/23 12:00 SE243929.029	HS7 SOIL - 1/3/23 12:00 SE243929.030	HS8 SOIL - 1/3/23 12:00 SE243929.031
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7	<1.7	<1.7

PARAMETER	UOM	LOR	HS9 SOIL - 1/3/23 12:00 SE243929.032	HS10 SOIL - 1/3/23 12:00 SE243929.033
Dichlorvos	mg/kg	0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 3/3/2023

PARAMETER	UOM	LOR	SP1 SOIL - 1/3/23 12:00 SE243929.001	SP2 SOIL - 1/3/23 12:00 SE243929.002	SP3 SOIL - 1/3/23 12:00 SE243929.003	SP4 SOIL - 1/3/23 12:00 SE243929.004	SP5 SOIL - 1/3/23 12:00 SE243929.005
Arsenic, As	mg/kg	1	15	1	1	1	<1
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	78	9.2	10	7.7	6.2
Copper, Cu	mg/kg	0.5	67	8.2	6.4	6.5	4.2
Lead, Pb	mg/kg	1	50	6	5	7	4
Nickel, Ni	mg/kg	0.5	16	3.2	2.3	2.0	1.2
Zinc, Zn	mg/kg	2	120	17	13	9.5	6.2

PARAMETER	UOM	LOR	SP6 SOIL - 1/3/23 12:00 SE243929.006	SP7 SOIL - 1/3/23 12:00 SE243929.007	SP8 SOIL - 1/3/23 12:00 SE243929.008	SP9 SOIL - 1/3/23 12:00 SE243929.009	SP10 SOIL - 1/3/23 12:00 SE243929.010
Arsenic, As	mg/kg	1	1	<1	<1	<1	1
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	7.3	8.3	7.0	6.2	11
Copper, Cu	mg/kg	0.5	5.2	4.7	5.1	4.4	5.9
Lead, Pb	mg/kg	1	6	5	5	6	6
Nickel, Ni	mg/kg	0.5	1.5	1.5	1.4	1.2	2.2
Zinc, Zn	mg/kg	2	7.4	7.2	7.1	7.9	7.7

PARAMETER	UOM	LOR	SP11 SOIL - 1/3/23 12:00 SE243929.011	SP12 SOIL - 1/3/23 12:00 SE243929.012	SP13 SOIL - 1/3/23 12:00 SE243929.013	SP14 SOIL - 1/3/23 12:00 SE243929.014	SP15 SOIL - 1/3/23 12:00 SE243929.015
Arsenic, As	mg/kg	1	2	1	<1	<1	2
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	33	7.9	7.1	16	20
Copper, Cu	mg/kg	0.5	7.6	5.8	5.1	5.8	10
Lead, Pb	mg/kg	1	9	5	4	6	8
Nickel, Ni	mg/kg	0.5	4.8	1.8	1.5	2.0	4.6
Zinc, Zn	mg/kg	2	12	7.9	8.6	7.6	17

PARAMETER	UOM	LOR	SP16 SOIL - 1/3/23 12:00 SE243929.016	SP17 SOIL - 1/3/23 12:00 SE243929.017	SP18 SOIL - 1/3/23 12:00 SE243929.018	SP19 SOIL - 1/3/23 12:00 SE243929.019	SP20 SOIL - 1/3/23 12:00 SE243929.020
Arsenic, As	mg/kg	1	2	2	2	1	2
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	110	72	52	21	13
Copper, Cu	mg/kg	0.5	12	11	8.6	5.3	7.6
Lead, Pb	mg/kg	1	11	10	10	6	6
Nickel, Ni	mg/kg	0.5	7.8	7.1	4.6	2.1	3.2
Zinc, Zn	mg/kg	2	19	19	21	8.3	15

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 3/3/2023

(continued)

PARAMETER	UOM	LOR	SP21 SOIL - 1/3/23 12:00 SE243929.021	SP22 SOIL - 1/3/23 12:00 SE243929.022	SP23 SOIL - 1/3/23 12:00 SE243929.023	HS1 SOIL - 1/3/23 12:00 SE243929.024	HS2 SOIL - 1/3/23 12:00 SE243929.025
Arsenic, As	mg/kg	1	3	2	2	-	4
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	-	2.1
Chromium, Cr	mg/kg	0.5	40	29	93	-	24
Copper, Cu	mg/kg	0.5	6.7	8.6	11	-	21
Lead, Pb	mg/kg	1	9	9	9	20	70
Nickel, Ni	mg/kg	0.5	2.8	4.0	7.4	-	7.9
Zinc, Zn	mg/kg	2	13	15	18	-	1900

PARAMETER	UOM	LOR	HS3 SOIL - 1/3/23 12:00 SE243929.026	HS4 SOIL - 1/3/23 12:00 SE243929.027	HS5 SOIL - 1/3/23 12:00 SE243929.028	HS6 SOIL - 1/3/23 12:00 SE243929.029	HS7 SOIL - 1/3/23 12:00 SE243929.030
Arsenic, As	mg/kg	1	4	3	5	2	2
Cadmium, Cd	mg/kg	0.3	1.0	0.6	0.5	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	27	18	26	32	28
Copper, Cu	mg/kg	0.5	47	57	53	12	15
Lead, Pb	mg/kg	1	130	120	56	15	11
Nickel, Ni	mg/kg	0.5	8.1	8.8	7.7	7.5	6.7
Zinc, Zn	mg/kg	2	970	7300	730	100	150

PARAMETER	UOM	LOR	HS8 SOIL - 1/3/23 12:00 SE243929.031	HS9 SOIL - 1/3/23 12:00 SE243929.032	HS10 SOIL - 1/3/23 12:00 SE243929.033	DA1 SOIL - 1/3/23 12:00 SE243929.034	DA2 SOIL - 1/3/23 12:00 SE243929.035
Arsenic, As	mg/kg	1	3	19	2	5	<1
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	1.1	<0.3
Chromium, Cr	mg/kg	0.5	37	50	31	29	7.5
Copper, Cu	mg/kg	0.5	16	64	17	45	4.3
Lead, Pb	mg/kg	1	16	4	30	140	5
Nickel, Ni	mg/kg	0.5	8.1	22	10	8.6	1.6
Zinc, Zn	mg/kg	2	140	59	150	930	12

PARAMETER	UOM	LOR	DA3 SOIL - 1/3/23 12:00 SE243929.036
Arsenic, As	mg/kg	1	1
Cadmium, Cd	mg/kg	0.3	<0.3
Chromium, Cr	mg/kg	0.5	14
Copper, Cu	mg/kg	0.5	7.1
Lead, Pb	mg/kg	1	6
Nickel, Ni	mg/kg	0.5	3.0
Zinc, Zn	mg/kg	2	14

Mercury in Soil [AN312] Tested: 3/3/2023

PARAMETER	UOM	LOR	HS4 SOIL - 1/3/23 12:00 SE243929.027	HS5 SOIL - 1/3/23 12:00 SE243929.028
Mercury	mg/kg	0.05	<0.05	**0.28**

Moisture Content [AN002] Tested: 3/3/2023

PARAMETER	UOM	LOR	SP1 SOIL - 1/3/23 12:00 SE243929.001	SP2 SOIL - 1/3/23 12:00 SE243929.002	SP3 SOIL - 1/3/23 12:00 SE243929.003	SP4 SOIL - 1/3/23 12:00 SE243929.004	SP5 SOIL - 1/3/23 12:00 SE243929.005
% Moisture	%w/w	1	8.9	8.9	10.5	12.4	5.1

PARAMETER	UOM	LOR	SP6 SOIL - 1/3/23 12:00 SE243929.006	SP7 SOIL - 1/3/23 12:00 SE243929.007	SP8 SOIL - 1/3/23 12:00 SE243929.008	SP9 SOIL - 1/3/23 12:00 SE243929.009	SP10 SOIL - 1/3/23 12:00 SE243929.010
% Moisture	%w/w	1	7.6	5.0	10.6	7.3	13.6

PARAMETER	UOM	LOR	SP11 SOIL - 1/3/23 12:00 SE243929.011	SP12 SOIL - 1/3/23 12:00 SE243929.012	SP13 SOIL - 1/3/23 12:00 SE243929.013	SP14 SOIL - 1/3/23 12:00 SE243929.014	SP15 SOIL - 1/3/23 12:00 SE243929.015
% Moisture	%w/w	1	8.0	7.8	10.5	10.7	11.9

PARAMETER	UOM	LOR	SP16 SOIL - 1/3/23 12:00 SE243929.016	SP17 SOIL - 1/3/23 12:00 SE243929.017	SP18 SOIL - 1/3/23 12:00 SE243929.018	SP19 SOIL - 1/3/23 12:00 SE243929.019	SP20 SOIL - 1/3/23 12:00 SE243929.020
% Moisture	%w/w	1	10.7	9.9	8.6	7.7	11.1

PARAMETER	UOM	LOR	SP21 SOIL - 1/3/23 12:00 SE243929.021	SP22 SOIL - 1/3/23 12:00 SE243929.022	SP23 SOIL - 1/3/23 12:00 SE243929.023	HS1 SOIL - 1/3/23 12:00 SE243929.024	HS2 SOIL - 1/3/23 12:00 SE243929.025
% Moisture	%w/w	1	8.5	9.1	12.5	11.1	16.4

PARAMETER	UOM	LOR	HS3 SOIL - 1/3/23 12:00 SE243929.026	HS4 SOIL - 1/3/23 12:00 SE243929.027	HS5 SOIL - 1/3/23 12:00 SE243929.028	HS6 SOIL - 1/3/23 12:00 SE243929.029	HS7 SOIL - 1/3/23 12:00 SE243929.030
% Moisture	%w/w	1	16.3	35.1	10.8	8.9	9.3

PARAMETER	UOM	LOR	HS8 SOIL - 1/3/23 12:00 SE243929.031	HS9 SOIL - 1/3/23 12:00 SE243929.032	HS10 SOIL - 1/3/23 12:00 SE243929.033	DA1 SOIL - 1/3/23 12:00 SE243929.034	DA2 SOIL - 1/3/23 12:00 SE243929.035
% Moisture	%w/w	1	7.9	12.4	9.1	15.6	8.7

Moisture Content [AN002] Tested: 3/3/2023 (continued)

PARAMETER	UOM	LOR	DA3 SOIL - 1/3/23 12:00 SE243929.036
% Moisture	%w/w	1	**11.7**

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.
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). Total PAH calculated from individual analyte detections at or above the limit of reporting .
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.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		
***	Indicates that both * and ** apply.				

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:

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

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

The QC 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.

STATEMENT OF QA/QC PERFORMANCE

SE243929 R0

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	**14501**
Order Number	**14501**
Samples	36

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	**SE243929 R0**
Date Received	03 Mar 2023
Date Reported	10 Mar 2023

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:

Analysis Date	Moisture Content	36 items
Duplicate	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	1 item
	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	3 items

SAMPLE SUMMARY

Sample counts by matrix	36 Soil	Type of documentation received	COC
Date documentation received	3/3/2023	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	18.3°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

HOLDING TIME SUMMARY

SE243929 R0

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)-[ENV]AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HS4	SE243929.027	LB273013	01 Mar 2023	03 Mar 2023	29 Mar 2023	03 Mar 2023	29 Mar 2023	10 Mar 2023
HS5	SE243929.028	LB273013	01 Mar 2023	03 Mar 2023	29 Mar 2023	03 Mar 2023	29 Mar 2023	10 Mar 2023

Moisture Content

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SP1	SE243929.001	LB273003	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
SP2	SE243929.002	LB273003	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
SP3	SE243929.003	LB273003	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
SP4	SE243929.004	LB273003	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
SP5	SE243929.005	LB273003	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
SP6	SE243929.006	LB273003	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
SP7	SE243929.007	LB273003	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
SP8	SE243929.008	LB273003	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
SP9	SE243929.009	LB273003	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
SP10	SE243929.010	LB273003	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
SP11	SE243929.011	LB273003	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
SP12	SE243929.012	LB273003	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
SP13	SE243929.013	LB273003	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
SP14	SE243929.014	LB273003	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
SP15	SE243929.015	LB273003	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
SP16	SE243929.016	LB273003	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
SP17	SE243929.017	LB273003	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
SP18	SE243929.018	LB273003	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
SP19	SE243929.019	LB273003	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
SP20	SE243929.020	LB273031	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
SP21	SE243929.021	LB273031	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
SP22	SE243929.022	LB273031	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
SP23	SE243929.023	LB273031	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
HS1	SE243929.024	LB273031	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
HS2	SE243929.025	LB273031	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
HS3	SE243929.026	LB273031	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
HS4	SE243929.027	LB273031	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
HS5	SE243929.028	LB273031	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
HS6	SE243929.029	LB273031	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
HS7	SE243929.030	LB273031	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
HS8	SE243929.031	LB273031	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
HS9	SE243929.032	LB273031	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
HS10	SE243929.033	LB273031	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
DA1	SE243929.034	LB273031	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
DA2	SE243929.035	LB273031	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†
DA3	SE243929.036	LB273031	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	08 Mar 2023	10 Mar 2023†

OC Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HS1	SE243929.024	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023
HS2	SE243929.025	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	09 Mar 2023
HS3	SE243929.026	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	09 Mar 2023
HS4	SE243929.027	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023
HS5	SE243929.028	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023
HS6	SE243929.029	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	09 Mar 2023
HS7	SE243929.030	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	09 Mar 2023
HS8	SE243929.031	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	09 Mar 2023
HS9	SE243929.032	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	09 Mar 2023
HS10	SE243929.033	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	09 Mar 2023

OP Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HS1	SE243929.024	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023
HS2	SE243929.025	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	09 Mar 2023
HS3	SE243929.026	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	09 Mar 2023
HS4	SE243929.027	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023

HOLDING TIME SUMMARY

SE243929 R0

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

OP Pesticides in Soil (continued)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HS5	SE243929.028	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023
HS6	SE243929.029	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	09 Mar 2023
HS7	SE243929.030	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	09 Mar 2023
HS8	SE243929.031	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023
HS9	SE243929.032	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023
HS10	SE243929.033	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HS1	SE243929.024	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	09 Mar 2023
HS2	SE243929.025	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023
HS3	SE243929.026	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023
HS4	SE243929.027	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	09 Mar 2023
HS5	SE243929.028	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	09 Mar 2023
HS6	SE243929.029	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023
HS7	SE243929.030	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023
HS8	SE243929.031	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023
HS9	SE243929.032	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023
HS10	SE243929.033	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023

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
SP1	SE243929.001	LB273006	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
SP2	SE243929.002	LB273006	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
SP3	SE243929.003	LB273006	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
SP4	SE243929.004	LB273006	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
SP5	SE243929.005	LB273006	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
SP6	SE243929.006	LB273006	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
SP7	SE243929.007	LB273006	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
SP8	SE243929.008	LB273006	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
SP9	SE243929.009	LB273006	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
SP10	SE243929.010	LB273006	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
SP11	SE243929.011	LB273006	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
SP12	SE243929.012	LB273006	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
SP13	SE243929.013	LB273006	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
SP14	SE243929.014	LB273006	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
SP15	SE243929.015	LB273006	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
SP16	SE243929.016	LB273006	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
SP17	SE243929.017	LB273006	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
SP18	SE243929.018	LB273006	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
SP19	SE243929.019	LB273006	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
SP20	SE243929.020	LB273029	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
SP21	SE243929.021	LB273029	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
SP22	SE243929.022	LB273029	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
SP23	SE243929.023	LB273029	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
HS1	SE243929.024	LB273029	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
HS2	SE243929.025	LB273029	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
HS3	SE243929.026	LB273029	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
HS4	SE243929.027	LB273029	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
HS5	SE243929.028	LB273029	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
HS6	SE243929.029	LB273029	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
HS7	SE243929.030	LB273029	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
HS8	SE243929.031	LB273029	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
HS9	SE243929.032	LB273029	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
HS10	SE243929.033	LB273029	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
DA1	SE243929.034	LB273029	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
DA2	SE243929.035	LB273029	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023
DA3	SE243929.036	LB273029	01 Mar 2023	03 Mar 2023	28 Aug 2023	03 Mar 2023	28 Aug 2023	10 Mar 2023

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref

HOLDING TIME SUMMARY

SE243929 R0

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

TRH (Total Recoverable Hydrocarbons) in Soil (continued)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HS1	SE243929.024	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023
HS2	SE243929.025	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023
HS3	SE243929.026	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023
HS4	SE243929.027	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023
HS5	SE243929.028	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023
HS6	SE243929.029	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023
HS7	SE243929.030	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023
HS8	SE243929.031	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023
HS9	SE243929.032	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023
HS10	SE243929.033	LB273060	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	12 Apr 2023	10 Mar 2023

VOC's in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HS1	SE243929.024	LB273065	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	15 Mar 2023	09 Mar 2023
HS4	SE243929.027	LB273065	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	15 Mar 2023	09 Mar 2023
HS5	SE243929.028	LB273065	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	15 Mar 2023	09 Mar 2023

Volatile Petroleum Hydrocarbons in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HS1	SE243929.024	LB273065	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	15 Mar 2023	09 Mar 2023
HS4	SE243929.027	LB273065	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	15 Mar 2023	09 Mar 2023
HS5	SE243929.028	LB273065	01 Mar 2023	03 Mar 2023	15 Mar 2023	03 Mar 2023	15 Mar 2023	09 Mar 2023

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 identifer 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)	HS2	SE243929.025	%	60 - 130%	90
	HS3	SE243929.026	%	60 - 130%	84
	HS6	SE243929.029	%	60 - 130%	85
	HS7	SE243929.030	%	60 - 130%	84
	HS8	SE243929.031	%	60 - 130%	94
	HS9	SE243929.032	%	60 - 130%	89
	HS10	SE243929.033	%	60 - 130%	90

OP Pesticides in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	HS2	SE243929.025	%	60 - 130%	101
	HS3	SE243929.026	%	60 - 130%	102
	HS6	SE243929.029	%	60 - 130%	101
	HS7	SE243929.030	%	60 - 130%	118
	HS8	SE243929.031	%	60 - 130%	106
	HS9	SE243929.032	%	60 - 130%	103
	HS10	SE243929.033	%	60 - 130%	106
d14-p-terphenyl (Surrogate)	HS2	SE243929.025	%	60 - 130%	109
	HS3	SE243929.026	%	60 - 130%	109
	HS6	SE243929.029	%	60 - 130%	112
	HS7	SE243929.030	%	60 - 130%	110
	HS8	SE243929.031	%	60 - 130%	120
	HS9	SE243929.032	%	60 - 130%	117
	HS10	SE243929.033	%	60 - 130%	117

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	HS1	SE243929.024	%	70 - 130%	99
	HS4	SE243929.027	%	70 - 130%	103
	HS5	SE243929.028	%	70 - 130%	104
d14-p-terphenyl (Surrogate)	HS1	SE243929.024	%	70 - 130%	111
	HS4	SE243929.027	%	70 - 130%	115
	HS5	SE243929.028	%	70 - 130%	114
d5-nitrobenzene (Surrogate)	HS1	SE243929.024	%	70 - 130%	98
	HS4	SE243929.027	%	70 - 130%	106
	HS5	SE243929.028	%	70 - 130%	108

VOC's in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	HS1	SE243929.024	%	60 - 130%	81
	HS4	SE243929.027	%	60 - 130%	69
	HS5	SE243929.028	%	60 - 130%	90
d4-1,2-dichloroethane (Surrogate)	HS1	SE243929.024	%	60 - 130%	87
	HS4	SE243929.027	%	60 - 130%	76
	HS5	SE243929.028	%	60 - 130%	88
d8-toluene (Surrogate)	HS1	SE243929.024	%	60 - 130%	91
	HS4	SE243929.027	%	60 - 130%	78
	HS5	SE243929.028	%	60 - 130%	102

Volatile Petroleum Hydrocarbons in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	HS1	SE243929.024	%	60 - 130%	81
	HS4	SE243929.027	%	60 - 130%	69
	HS5	SE243929.028	%	60 - 130%	90
d4-1,2-dichloroethane (Surrogate)	HS1	SE243929.024	%	60 - 130%	87
	HS4	SE243929.027	%	60 - 130%	76
	HS5	SE243929.028	%	60 - 130%	88
d8-toluene (Surrogate)	HS1	SE243929.024	%	60 - 130%	91
	HS4	SE243929.027	%	60 - 130%	78
	HS5	SE243929.028	%	60 - 130%	102

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
LB273013.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB273060.001		Alpha BHC	mg/kg	0.1	<0.1
		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
		Beta BHC	mg/kg	0.1	<0.1
		Lindane (gamma BHC)	mg/kg	0.1	<0.1
		Delta BHC	mg/kg	0.1	<0.1
		Heptachlor	mg/kg	0.1	<0.1
		Aldrin	mg/kg	0.1	<0.1
		Isodrin	mg/kg	0.1	<0.1
		Heptachlor epoxide	mg/kg	0.1	<0.1
		Gamma Chlordane	mg/kg	0.1	<0.1
		Alpha Chlordane	mg/kg	0.1	<0.1
		Alpha Endosulfan	mg/kg	0.2	<0.1
		p,p'-DDE	mg/kg	0.1	<0.1
		Dieldrin	mg/kg	0.2	<0.1
		Endrin	mg/kg	0.2	<0.1
		Beta Endosulfan	mg/kg	0.2	<0.1
		p,p'-DDD	mg/kg	0.1	<0.1
		Endrin aldehyde	mg/kg	0.1	<0.1
		Endosulfan sulphate	mg/kg	0.1	<0.1
		p,p'-DDT	mg/kg	0.1	<0.1
		Endrin ketone	mg/kg	0.1	<0.1
		Methoxychlor	mg/kg	0.1	<0.1
		Mirex	mg/kg	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	91

OP Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB273060.001		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
		Bromophos Ethyl	mg/kg	0.2	<0.2
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5
		Dichlorvos	mg/kg	0.5	<0.5
		Dimethoate	mg/kg	0.5	<0.5
		Ethion	mg/kg	0.2	<0.2
		Fenitrothion	mg/kg	0.2	<0.2
		Malathion	mg/kg	0.2	<0.2
		Methidathion	mg/kg	0.5	<0.5
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	125
		d14-p-terphenyl (Surrogate)	%	-	123

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB273060.001	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

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.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Sample Number		Parameter	Units	LOR	Result
LB273060.001		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)	%	-	122
		2-fluorobiphenyl (Surrogate)	%	-	125
		d14-p-terphenyl (Surrogate)	%	-	123

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

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

Sample Number	Parameter	Units	LOR	Result
LB273006.001	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
LB273029.001	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
LB273060.001	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
LB273065.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	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 (VOC)*	mg/kg	0.1	<0.1
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	96
		d8-toluene (Surrogate)	%	-	102
		Bromofluorobenzene (Surrogate)	%	-	85
	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
LB273065.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	96

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 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 x 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 identifer 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)-[ENV]AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE243928.029	LB273013.014	Mercury	mg/kg	0.05	<0.05	<0.05	200	0
SE243928.035	LB273013.021	Mercury	mg/kg	0.05	0.07	<0.05	133	29

Moisture Content

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE243929.010	LB273003.011	% Moisture	%w/w	1	13.6	10.2	38	29
SE243929.019	LB273003.021	% Moisture	%w/w	1	7.7	6.5	44	17
SE243929.029	LB273031.011	% Moisture	%w/w	1	8.9	8.9	41	0
SE243929.036	LB273031.019	% Moisture	%w/w	1	11.7	11.5	39	2

OC Pesticides in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE243913.004	LB273060.036		Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane (gamma BHC)	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	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
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	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
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.1	200	0
			o,p'-DDE*	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	<0.1	200	0
			Endrin	mg/kg	0.2	<0.2	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.1	200	0
			o,p'-DDD*	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT*	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
			Total OC VIC EPA	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.13	0.13	30	1
SE243958.007	LB273060.032		Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane (gamma BHC)	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	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
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	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
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.1	200	0
			o,p'-DDE*	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	<0.1	200	0
			Endrin	mg/kg	0.2	<0.2	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.1	200	0
			o,p'-DDD*	mg/kg	0.1	<0.1	<0.1	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 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 x 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 identifer 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

OC Pesticides in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE243958.007	LB273060.032		p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT*	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
			Total OC VIC EPA	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.12	0.13	30	2

OP Pesticides in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE243913.004	LB273060.034		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	200	0
			Dichlorvos	mg/kg	0.5	<0.5	<0.5	200	0
			Dimethoate	mg/kg	0.5	<0.5	<0.5	200	0
			Ethion	mg/kg	0.2	<0.2	<0.2	200	0
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	200	0
			Malathion	mg/kg	0.2	<0.2	<0.2	200	0
			Methidathion	mg/kg	0.5	<0.5	<0.5	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	200	0
			Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	3
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.6	0.5	30	2

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE243913.004	LB273060.034		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/2*	mg/kg	0.2	<0.2	<0.2	175	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR*	mg/kg	0.3	<0.3	<0.3	134	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	30	2
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	3
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.6	0.5	30	2

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

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

Original	Duplicate	Parameter	Units	LOR

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 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 x 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 identifer 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 %
SE243929.010	LB273006.014	Arsenic, As	mg/kg	1	1	1	117	25
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	11	13	34	16
		Copper, Cu	mg/kg	0.5	5.9	6.1	38	2
		Nickel, Ni	mg/kg	0.5	2.2	2.2	52	2
		Lead, Pb	mg/kg	1	6	6	46	3
		Zinc, Zn	mg/kg	2	7.7	7.9	56	2
SE243929.019	LB273006.024	Arsenic, As	mg/kg	1	1	<1	128	12
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	21	15	33	35 ②
		Copper, Cu	mg/kg	0.5	5.3	5.2	40	2
		Nickel, Ni	mg/kg	0.5	2.1	2.0	54	5
		Lead, Pb	mg/kg	1	6	6	47	0
		Zinc, Zn	mg/kg	2	8.3	8.6	54	3
SE243929.029	LB273029.014	Arsenic, As	mg/kg	1	2	5	58	75 ②
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	32	38	31	17
		Copper, Cu	mg/kg	0.5	12	18	33	34 ②
		Nickel, Ni	mg/kg	0.5	7.5	7.6	37	0
		Lead, Pb	mg/kg	1	15	22	35	40 ②
		Zinc, Zn	mg/kg	2	100	86	32	18
SE243929.036	LB273029.022	Arsenic, As	mg/kg	1	1	2	99	12
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	14	16	33	16
		Copper, Cu	mg/kg	0.5	7.1	7.4	37	3
		Nickel, Ni	mg/kg	0.5	3.0	3.2	46	6
		Lead, Pb	mg/kg	1	6	6	46	4
		Zinc, Zn	mg/kg	2	14	15	44	3

TRH (Total Recoverable Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE243913.004	LB273060.034		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
SE243958.007	LB273060.032		TRH C10-C14	mg/kg	20	1300	1500	31	15
			TRH C15-C28	mg/kg	45	4900	5700	31	15
			TRH C29-C36	mg/kg	45	110	140	66	24
			TRH C37-C40	mg/kg	100	<100	<100	150	0
			TRH C10-C36 Total	mg/kg	110	6400	7400	32	15
			TRH >C10-C40 Total (F bands)	mg/kg	210	6300	7500	33	17
		TRH F Bands	TRH >C10-C16	mg/kg	25	2400	2900	31	16
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	2400	2900	31	16
			TRH >C16-C34 (F3)	mg/kg	90	3900	4500	32	15
			TRH >C34-C40 (F4)	mg/kg	120	<120	140	123	16

VOC's in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE243958.001	LB273065.014	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			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	101	3
		Polycyclic	Naphthalene (VOC)*	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.3	9.0	50	8
			d8-toluene (Surrogate)	mg/kg	-	10.1	10.5	50	4

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 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 x 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 identifer 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

VOC's in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE243958.001	LB273065.014	Surrogates	Bromofluorobenzene (Surrogate)	mg/kg	-	10.1	11.9	50	16
		Totals	Total BTEX*	mg/kg	0.6	<0.6	<0.6	200	0
			Total Xylenes*	mg/kg	0.3	<0.3	<0.3	200	0
SE243958.007	LB273065.021	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			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 (VOC)*	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	7.8	7.5	50	5
			d8-toluene (Surrogate)	mg/kg	-	10.4	10.9	50	5
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.6	9.8	50	2
		Totals	Total BTEX*	mg/kg	0.6	<0.6	<0.6	200	0
			Total Xylenes*	mg/kg	0.3	<0.3	<0.3	200	0

Volatile Petroleum Hydrocarbons in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE243958.001	LB273065.014		TRH C6-C10	mg/kg	25	50	40	86	23
			TRH C6-C9	mg/kg	20	29	21	111	32
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.3	9.0	30	8
			d8-toluene (Surrogate)	mg/kg	-	10.1	10.5	30	4
			Bromofluorobenzene (Surrogate)	mg/kg	-	10.1	11.9	30	16
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	50	39	86	24
SE243958.007	LB273065.021		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	-	7.8	7.5	30	5
			d8-toluene (Surrogate)	mg/kg	-	10.4	10.9	30	5
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.6	9.8	30	2
		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 %
LB273013.002	Mercury	mg/kg	0.05	0.20	0.2	70 - 130	98

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB273060.002		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	93
		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	104
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	94
		Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	96
		Endrin	mg/kg	0.2	0.2	0.2	60 - 140	93
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	86
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.12	0.15	40 - 130	83

OP Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB273060.002		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	1.8	2	60 - 140	88
		Diazinon (Dimpylate)	mg/kg	0.5	1.8	2	60 - 140	88
		Dichlorvos	mg/kg	0.5	1.6	2	60 - 140	81
		Ethion	mg/kg	0.2	1.5	2	60 - 140	77
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	99
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	108

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB273060.002		Naphthalene	mg/kg	0.1	4.3	4	60 - 140	106
		Acenaphthylene	mg/kg	0.1	4.1	4	60 - 140	102
		Acenaphthene	mg/kg	0.1	4.4	4	60 - 140	109
		Phenanthrene	mg/kg	0.1	4.2	4	60 - 140	104
		Anthracene	mg/kg	0.1	4.3	4	60 - 140	107
		Fluoranthene	mg/kg	0.1	4.4	4	60 - 140	111
		Pyrene	mg/kg	0.1	4.4	4	60 - 140	109
		Benzo(a)pyrene	mg/kg	0.1	4.7	4	60 - 140	118
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	99
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	99
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	108

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 %
LB273006.002	Arsenic, As	mg/kg	1	360	318.22	80 - 120	114
	Cadmium, Cd	mg/kg	0.3	4.8	4.81	70 - 130	100
	Chromium, Cr	mg/kg	0.5	38	38.31	80 - 120	98
	Copper, Cu	mg/kg	0.5	330	290	80 - 120	114
	Nickel, Ni	mg/kg	0.5	190	187	80 - 120	103
	Lead, Pb	mg/kg	1	95	89.9	80 - 120	105
	Zinc, Zn	mg/kg	2	290	273	80 - 120	106
LB273029.002	Arsenic, As	mg/kg	1	360	318.22	80 - 120	112
	Cadmium, Cd	mg/kg	0.3	4.7	4.81	70 - 130	97
	Chromium, Cr	mg/kg	0.5	36	38.31	80 - 120	95
	Copper, Cu	mg/kg	0.5	320	290	80 - 120	112
	Nickel, Ni	mg/kg	0.5	190	187	80 - 120	100
	Lead, Pb	mg/kg	1	93	89.9	80 - 120	103
	Zinc, Zn	mg/kg	2	290	273	80 - 120	105

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB273060.002		TRH C10-C14	mg/kg	20	52	40	60 - 140	129
		TRH C15-C28	mg/kg	45	49	40	60 - 140	123
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	86
	TRH F Bands	TRH >C10-C16	mg/kg	25	52	40	60 - 140	130
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	111
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	78

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

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB273065.002	Monocyclic Aromatic	Benzene	mg/kg	0.1	4.2	5	60 - 140	83
		Toluene	mg/kg	0.1	4.5	5	60 - 140	91
		Ethylbenzene	mg/kg	0.1	5.0	5	60 - 140	100
		m/p-xylene	mg/kg	0.2	9.7	10	60 - 140	97
		o-xylene	mg/kg	0.1	5.1	5	60 - 140	103
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.4	10	70 - 130	94
		d8-toluene (Surrogate)	mg/kg	-	9.9	10	70 - 130	99
		Bromofluorobenzene (Surrogate)	mg/kg	-	10.1	10	70 - 130	101

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB273065.002		TRH C6-C10	mg/kg	25	98	92.5	60 - 140	106
		TRH C6-C9	mg/kg	20	86	80	60 - 140	108
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.4	10	70 - 130	94
		Bromofluorobenzene (Surrogate)	mg/kg	-	10.1	10	70 - 130	101
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	69	62.5	60 - 140	111

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 identifer 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%
SE243928.020	LB273013.004	Mercury	mg/kg	0.05	0.25	<0.05	0.2	112

OC Pesticides in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE243913.001	LB273060.004		Alpha BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	-	-
			Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Lindane (gamma BHC)	mg/kg	0.1	<0.1	<0.1	-	-
			Delta BHC	mg/kg	0.1	0.2	<0.1	0.2	83
			Heptachlor	mg/kg	0.1	0.2	<0.1	0.2	100
			Aldrin	mg/kg	0.1	0.2	<0.1	0.2	89
			Isodrin	mg/kg	0.1	<0.1	<0.1	-	-
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	-	-
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Endosulfan	mg/kg	0.2	<0.1	<0.2	-	-
			o,p'-DDE*	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	90
			Endrin	mg/kg	0.2	0.2	<0.2	0.2	86
			Beta Endosulfan	mg/kg	0.2	<0.1	<0.2	-	-
			o,p'-DDD*	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin aldehyde	mg/kg	0.1	<0.1	<0.1	-	-
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDT*	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDT	mg/kg	0.1	0.2	<0.1	0.2	84
			Endrin ketone	mg/kg	0.1	<0.1	<0.1	-	-
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	-	-
			Mirex	mg/kg	0.1	<0.1	<0.1	-	-
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	-	-
			Total CLP OC Pesticides	mg/kg	1	1	<1	-	-
			Total OC VIC EPA	mg/kg	1	1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.13	0.13	-	84

OP Pesticides in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE243913.001	LB273060.004		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	-	-
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	-	-
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	1.7	<0.2	2	85
			Diazinon (Dimpylate)	mg/kg	0.5	1.7	<0.5	2	84
			Dichlorvos	mg/kg	0.5	1.6	<0.5	2	80
			Dimethoate	mg/kg	0.5	<0.5	<0.5	-	-
			Ethion	mg/kg	0.2	1.5	<0.2	2	76
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	-	-
			Malathion	mg/kg	0.2	<0.2	<0.2	-	-
			Methidathion	mg/kg	0.5	<0.5	<0.5	-	-
			Parathion-ethyl (Parathion)	mg/kg	0.2	0.4	<0.2	-	-
			Total OP Pesticides*	mg/kg	1.7	6.9	<1.7	-	-
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	98
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	105

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE243913.001	LB273060.004	Naphthalene	mg/kg	0.1	4.2	<0.1	4	104
		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	3.9	<0.1	4	98
		Acenaphthene	mg/kg	0.1	4.2	<0.1	4	104
		Fluorene	mg/kg	0.1	<0.1	<0.1	-	-

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 identifer 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%
SE243913.001	LB273060.004		Phenanthrene	mg/kg	0.1	4.0	<0.1	4	101
			Anthracene	mg/kg	0.1	4.1	<0.1	4	102
			Fluoranthene	mg/kg	0.1	4.3	<0.1	4	108
			Pyrene	mg/kg	0.1	4.2	<0.1	4	106
			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	4.3	<0.1	4	107
			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	4.3	<0.2	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	4.3	<0.2	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR*	TEQ (mg/kg)	0.3	4.4	<0.3	-	-
			Total PAH (18)	mg/kg	0.8	33	<0.8	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	-	95
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	98
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	105

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%
SE243929.020	LB273029.004		Arsenic, As	mg/kg	1	48	2	50	92
			Cadmium, Cd	mg/kg	0.3	46	<0.3	50	91
			Chromium, Cr	mg/kg	0.5	60	13	50	95
			Copper, Cu	mg/kg	0.5	55	7.6	50	94
			Nickel, Ni	mg/kg	0.5	49	3.2	50	92
			Lead, Pb	mg/kg	1	51	6	50	90
			Zinc, Zn	mg/kg	2	63	15	50	96

TRH (Total Recoverable Hydrocarbons) in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE243913.001	LB273060.004		TRH C10-C14	mg/kg	20	47	<20	40	106
			TRH C15-C28	mg/kg	45	47	<45	40	108
			TRH C29-C36	mg/kg	45	<45	<45	40	71
			TRH C37-C40	mg/kg	100	<100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	<110	<110	-	-
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	-	-
		TRH F	TRH >C10-C16	mg/kg	25	47	<25	40	106
		Bands	TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	47	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	40	91
			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%
SE243913.001	LB273065.004	Monocyclic	Benzene	mg/kg	0.1	4.5	<0.1	5	89
		Aromatic	Toluene	mg/kg	0.1	4.9	<0.1	5	98
			Ethylbenzene	mg/kg	0.1	5.3	<0.1	5	105
			m/p-xylene	mg/kg	0.2	10	<0.2	10	101
			o-xylene	mg/kg	0.1	5.4	<0.1	5	108
		Polycyclic	Naphthalene (VOC)*	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.0	8.7	10	90
			d8-toluene (Surrogate)	mg/kg	-	9.6	9.3	10	96
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.9	8.4	10	99
		Totals	Total BTEX*	mg/kg	0.6	30	<0.6	-	-
			Total Xylenes*	mg/kg	0.3	16	<0.3	-	-

Volatile Petroleum Hydrocarbons in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE243913.001	LB273065.004		TRH C6-C10	mg/kg	25	99	<25	92.5	106
			TRH C6-C9	mg/kg	20	88	<20	80	110
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.0	8.7	10	90
			d8-toluene (Surrogate)	mg/kg	-	9.6	9.3	10	96

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 identifer 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**

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE243913.001	LB273065.004	Surrogates	Bromofluorobenzene (Surrogate)	mg/kg	-	9.9	8.4	-	99
		VPH F	Benzene (F0)	mg/kg	0.1	4.5	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	69	<25	62.5	109

MATRIX SPIKE DUPLICATES

SE243929 R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / 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 x 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 identifer 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.

Chain of Custody Form – Ref 14501

Ref: 14501
Investigator: Envirowest Consulting
9 Cameron Place
PO Box 8158
ORANGE NSW 2800
Telephone: (02) 6361 4954
Facsimile: (02) 6360 3960
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 #: Envir_70119_2019
Courier/CN: Grants Express

	Sample ID	Container*	Sampling Date/Time	Sample matrix: Water	Soil	Sludge	Sample preservation: Cool	HNO3/HCl	Unpre-served	Analysis (SGS Method Code): CL1T 7 Metals(Total)	CL9 TRH/BTEXN/PAH/Pb	CL10 TRH/BTEXN/PAH/8 METALS	OCP	OPP
1	SP1	A	01/03/2023		X		X		X	X				
2	SP2	A	01/03/2023		X		X		X	X				
3	SP3	A	01/03/2023		X		X		X	X				
4	SP4	A	01/03/2023		X		X		X	X				
5	SP5	A	01/03/2023		X		X		X	X				
6	SP6	A	01/03/2023		X		X		X	X				
7	SP7	A	01/03/2023		X		X		X	X				
8	SP8	A	01/03/2023		X		X		X	X				
9	SP9	A	01/03/2023		X		X		X	X				
10	SP10	A	01/03/2023		X		X		X	X				
11	SP11	A	01/03/2023		X		X		X	X				
12	SP12	A	01/03/2023		X		X		X	X				
13	SP13	A	01/03/2023		X		X		X	X				
14	SP14	A	01/03/2023		X		X		X	X				
15	SP15	A	01/03/2023		X		X		X	X				
16	SP16	A	01/03/2023		X		X		X	X				

SGS EHS Sydney COC
SE243929

Investigator: I attest that the proper field sampling procedures were used during the collection of these samples.

Sampler name: Leah Desborough
Date : 01/03/2023 Time:12:00

Relinquished by: Virginia Bragg (print and signature) Date: 02/03/2023 Time 16:00

Received by: (print and signature) Date 03/03/23 Time @ 6:50

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

Chain of Custody Form – Ref 14501

Ref:	**14501**
Investigator:	Envirowest Consulting 9 Cameron Place PO Box 8158 ORANGE NSW 2800
Telephone:	(02) 6361 4954
Facsimile:	(02) 6360 3960
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 #:	Envir_70119_2019
Courier/CN:	Grants Express

	Sample ID	Container*	Sampling Date/Time	Sample matrix: Water	Soil	Sludge	Sample preservation: Cool	HNO3/HCl	Unpreserved	Analysis – SGS Method Code: CL1T 7 Metals(Total)	CL9 TRH/BTEXN/PAH/Pb	CL10 TRH/BTEXN/PAH/8 METALS	OCP	OPP
17	SP17	A	01/03/2023		X		X		X	X				
18	SP18	A	01/03/2023		X		X		X	X				
19	SP19	A	01/03/2023		X		X		X	X				
20	SP20	A	01/03/2023		X		X		X	X				
21	SP21	A	01/03/2023		X		X		X	X				
22	SP22	A	01/03/2023		X		X		X	X				
23	SP23	A	01/03/2023		X		X		X	X				
24	HS1	A	01/03/2023		X		X		X		X			
25	HS2	A	01/03/2023		X		X		X	X			X	X
26	HS3	A	01/03/2023		X		X		X	X			X	X
27	HS4	A	01/03/2023		X		X		X			X		
28	HS5	A	01/03/2023		X		X		X			X		
29	HS6	A	01/03/2023		X		X		X	X			X	X
30	HS7	A	01/03/2023		X		X		X	X			X	X
31	HS8	A	01/03/2023		X		X		X	X			X	X
32	HS9	A	01/03/2023		X		X		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 : 01/03/2023 Time:12:00

Relinquished by: Virginia Bragg (print and signature) Date: 02/03/2023 Time 16:00

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Chain of Custody Form – Ref 14501

Ref:	**14501**		**Sample matrix**			**Sample preservation**			**Analysis**					
Investigator:	Envirowest Consulting 9 Cameron Place PO Box 8158 ORANGE NSW 2800								**SGS Method Code**					
Telephone:	(02) 6361 4954								**CL1T**	**CL9**	**CL10**			
Facsimile:	(02) 6360 3960													
Email:	leah@envirowest.net.au													
Contact Person:	Leah Desborough													
Invoice:	accounts@envirowest.net.au													
Laboratory:	SGS SYDNEY 16/33 Maddox Street ALEXANDRIA NSW 2015		Water	Soil	Sludge	Cool	HNO3/HCl	Unpre-served	7 Metals (Total)	TRH/BTEXN/ PAH/Pb	TRH/BTEXN/PAH/ 8 METALS	OCP	OPP	
Quotation #:	Envir_70119_2019													
Courier/CN:	Grants Express													
	Sample ID	**Container***	**Sampling Date/Time**											
33	HS10	A	01/03/2023		X		X		X	X			X	X
34	DA1	A	01/03/2023		X		X		X	X				
35	DA2	A	01/03/2023		X		X		X	X				
36	DA3	A	01/03/2023		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~~ : 01/03/2023 ~~Time:~~12:00
Relinquished by: Virginia Bragg (print and signature) Date: 02/03/2023 Time 16:00	Received by: (print and signature) Date 03/03/23 Time @ 6:50

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

ANALYTICAL REPORT

Accreditation No. 2562

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	**14501 - Additional**
Order Number	**14501**
Samples	36

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	**SE243929A R0**
Date Received	20/3/2023
Date Reported	27/3/2023

COMMENTS

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

SIGNATORIES

Dong LIANG
Metals/Inorganics Team Leader

Huong CRAWFORD
Production Manager

Hexavalent Chromium in Soil UV/Vis [AN075/AN201] Tested: 24/3/2023

PARAMETER	UOM	LOR	SP16 SOIL - 1/3/23 12:00 SE243929A.016
Hexavalent Chromium, Cr6+	mg/kg	0.5	<0.5

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.
***	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:

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

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

The QC 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.

STATEMENT OF QA/QC PERFORMANCE

SE243929A R0

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	**14501 - Additional**
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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	**SE243929A R0**
Date Received	20 Mar 2023
Date Reported	27 Mar 2023

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

Sample counts by matrix	1 Soil	Type of documentation received	Email
Date documentation received	20/3/2023@12:34pr	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	18.3°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

HOLDING TIME SUMMARY

SE243929A R0

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 sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

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
SP16	SE243929A.016	LB274898	01 Mar 2023	20 Mar 2023	29 Mar 2023	24 Mar 2023	31 Mar 2023	27 Mar 2023

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 identifer 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.

Hexavalent Chromium in Soil UV/Vis — **Method: ME-(AU)-[ENV]AN075/AN201**

Sample Number	Parameter	Units	LOR	Result
LB274898.001	Hexavalent Chromium, Cr6+	mg/kg	0.5	<0.5

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 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 x 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 identifer 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 give a different calculated RPD.

Hexavalent Chromium in Soil UV/Vis — **Method: ME-(AU)-[ENV]AN075/AN201**

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE243929A.016	LB274898.004	Hexavalent Chromium, Cr6+	mg/kg	0.5	<0.5	<0.5	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.

Hexavalent Chromium in Soil UV/Vis — **Method: ME-(AU)-[ENV]AN075/AN201**

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB274898.002	Hexavalent Chromium, Cr6+	mg/kg	0.5	15	20	70 - 130	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 identifer 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

SE243929A R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / 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 x 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 identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

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.

Yin, Emily (Sydney)

From: Leah Desborough <Leah@envirowest.net.au>
Sent: Monday, 20 March 2023 12:34 PM
To: AU.Environmental.Sydney, AU (Sydney); AU.SampleReceipt.Sydney, AU (Sydney)
Subject: [EXTERNAL] SE243929

*** WARNING: this message is from an EXTERNAL SENDER. Please be cautious, particularly with links and attachments. ***

Good afternoon

Could I please request analysis for hexavalent chromium for sample SP16? Standard turnaround time please.

Thanks

Leah Desborough
Senior Environmental Scientist

Envirowest Consulting Pty Ltd
9 Cameron Place
PO Box 8158
Orange NSW 2800
ph 02 6361 4954
leah@envirowest.net.au
www.envirowest.net.au

Appendix 5. Section 10.7 certificate

CABONNE COUNCIL

PLANNING CERTIFICATE

Section 10.7(2)

Environmental Planning and Assessment Act 1979 (as amended)

Applicant:	**Envirowest Consulting Pty Ltd** **PO Box 8158** **ORANGE NSW 2800**	**Certificate No: 2023/328** **Date: 21 April 2023**
Reference:	**14501**	**Receipt No: 94148 $62**
Doc Id:	**1513388**	

Address of Property:	**172 Spring Hill Road, Spring Hill NSW 2800**
Owner:	**SL Stewart & Est. Late IJ Stewart**
Land Description:	**Lot 2 and 4 DP 243203**
Council Assessment No:	**A41201**
Parish:	**Huntley**
Area:	**44.39 Ha**

CABONNE COUNCIL
PO Box 17
Molong NSW 2866
Phone: 6392 3265
Fax: 6392 3260
Email: council@cabonne.nsw.gov.au

Pursuant to section 10.7(2) of the Environmental Planning & Assessment Act 1979, the council certifies that at the date of this certificate the matters prescribed below apply to the subject land.

1. NAMES OF RELEVANT ENVIRONMENTAL PLANNING INSTRUMENTS AND DEVELOPMENT CONTROL PLANS THAT APPLY TO THE CARRYING OUT OF DEVELOPMENT UPON THE SUBJECT LAND

(a) What Local Environmental Plans apply to the land?

Cabonne Local Environmental Plan 2012.

(b) What draft Local Environmental Plans apply to the land?

Nil

(c) What Development Control Plans apply to the land?

- Development Control Plan No 5 - General Rural Zones
- Development Control Plan No 15 - Relocatable and Transportable Homes

(d) What State Environmental Planning Policies apply to the land?

State Environmental Planning Policy (Biodiversity and Conservation) 2021
State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008
State Environmental Planning Policy (Housing) 2021
State Environmental Planning Policy (Industry and Employment)
State Environmental Planning Policy No 65—Design Quality of Residential Apartment Development
State Environmental Planning Policy (Planning Systems) 2021
State Environmental Planning Policy (Primary Production) 2021
State Environmental Planning Policy (Resilience and Hazards) 2021
State Environmental Planning Policy (Resources and Energy) 2021
State Environmental Planning Policy (Sustainable Buildings) 2022 (to commence 1 October 2023)
State Environmental Planning Policy (Transport and Infrastructure) 2021

2. ZONING AND LAND USE UNDER RELEVANT EPIs

Cabonne Local Environmental Plan 2012

(a) Identity of Zone

Zone RU1 - Primary Production

(b)(i) In Zone RU1 the following is permissible without development consent:

Development for the purpose of:
Building identification signs, environmental protection works, extensive agriculture, home occupations, viticulture

(b)(ii) In Zone RU1 the following is permissible only with development consent

Subdivision

Development for the purpose of:
Air transport facilities, airstrips, animal boarding or training establishments, aquaculture, bed and breakfast accommodation, boat launching ramps, boat sheds, business identification signs, camping grounds, cellar door premises, cemeteries, community facilities, correctional centres, depots, dual occupancies, dwelling houses, eco-tourist facilities, environmental facilities, extractive industries, farm buildings, farm stay accommodation, flood mitigation works, forestry, function centres, helipads, home-based child care, home businesses, home industries, home occupations (sex services), industrial training facilities, information and education facilities, intensive livestock agriculture, intensive plant agriculture, jetties, landscaping material supplies, moorings, open cut mining, plant nurseries, recreation areas, recreation facilities (major), recreation facilities (outdoor), research stations, restaurants or cafes, roads, roadside stalls, rural industries, truck depots, veterinary hospitals, water recreation structures, water storage facilities

(b)(iii) In Zone RU1 the following is prohibited

Development for the purpose of:
Stock and sale yards, any other development not specified in items (b)(i) or (b)(ii) above

(c) Additional permitted uses

No additional permitted uses apply to the land

(d) Development standards applying to the land that fix minimum land dimensions for the erection of a dwelling house:

There are minimum development standards applying to the land that fix the minimum land dimensions for the erection of a dwelling house on the land. The minimum land dimension is 100 hectares. Refer to Clause 4.2A of the Cabonne Local Environmental Plan 2012 for further information.

(e) Outstanding biodiversity value

The land does not include or comprise an area of outstanding biodiversity value.

(f) Heritage conservation

The subject land is not within a heritage conservation area under Clause 5.10 and Schedule 5 of Cabonne Local Environmental Plan 2012

(g) Heritage item

The subject land is not a heritage item under Clause 5.10 and Schedule 5 of Cabonne Local Environmental Plan 2012.

3. CONTRIBUTION PLANS

What are the names of contribution plans applicable to the land?

- Cabonne Council Section 7.11 Development Contributions Plan – Heavy Vehicles adopted by Council 27 September 2022 and effective from 17 October 2022.
- Cabonne Council Section 7.12 Development Contributions Plan adopted by Council 27 September 2022 and effective from 17 October 2022.

4. COMPLYING DEVELOPMENT

Can complying development be carried out on the land under each of the complying development codes under State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 because of the provisions of clauses 1.17A(1)(c)-(e), 1.18(1)(c3), or 1.19 and if no complying development may be carried out on that land, the reasons why.

Complying Development Code	**Zone RU1**
(a) Housing Code	No - Not permissible in RU1 zone
(b) Rural Housing Code	Yes
(c) Low Rise Medium Density Housing Code	No - Not permissible in RU1 zone
(d) Greenfield Housing Code	No - Not Applicable to Cabonne Council
(e) Inland Code	Yes
(f) Housing Alterations Code	Yes
(g) General Development Code	Yes
(h) Industrial and Business Alterations Code	Yes
(i) Industrial and Business Buildings Code	No - Not applicable to RU1 zone
(j) Container Recycling Facilities Code	No - Not applicable to RU1 zone
(k) Subdivisions Code	Yes
(l) Demolition Code	Yes
(m) Fire Safety Code	Yes
(n) Agritourism and Farm Stay Accommodation Code	Yes

Note: The opportunity for complying development to be carried out under each of these Codes may be restricted where the land is a flood control lot, within a bushfire prone area, environmentally sensitive land, or subject to other site or zoning constraints. For more information about complying development visit the NSW Planning Portal website at www.planningportal.nsw.gov.au

5. EXEMPT DEVELOPMENT

Can exempt development be carried out on the land under each of the exempt development codes under State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 because of the provisions of clauses 1.16(1)(b1)-(d), or 1.16A, and if no exempt development may be carried out on that land, the reasons why.

Exempt development can be carried out on the land.

Note: The opportunity for exempt development to be carried out under this Code may be restricted where the land is a heritage item, within a heritage conservation area, a flood control lot, within a bushfire prone area, or subject to other site or zoning constraints. For more information about exempt development visit the NSW Planning Portal website at www.planningportal.nsw.gov.au

6. AFFECTED BUILDING NOTICES AND BUILDING PRODUCT RECTIFICATION ORDERS

Is Council aware that an Affected Building Notice is in force in relation to the land?

No

Is Council aware that a Building Product Rectification Order is in force in relation to the land that has not been fully complied with?

No

Is Council aware that a notice of intention to make a Building Product Rectification Order given in relation to the land is outstanding?

No

7. LAND RESERVED FOR ACQUISITION

Is the land reserved for acquisition pursuant to 3.15 of the Act under any Environmental Planning Instrument or draft Environmental Planning Instrument?

No

8. ROAD WIDENING AND ROAD REALIGNMENT

Is the land affected by any road widening or realignment under;
- Division 2 of Part 3 of the Roads Act 1993, or
- Any Environmental Planning Instrument, or
- Any resolution of Council.

No

9. FLOOD RELATED DEVELOPMENT CONTROLS

(1) If the land or part of the land is within the flood planning area and subject to flood related development controls.

No

(2) If the land or part of the land is between the flood planning area and the probable maximum flood and subject to flood related development controls.

No

(3) In this clause—
flood planning area has the same meaning as in the Floodplain Development Manual.
Floodplain Development Manual means the *Floodplain Development Manual* (ISBN 0 7347 5476 0) published by the NSW Government in April 2005.
probable maximum flood has the same meaning as in the Floodplain Development Manual.

10. COUNCIL & OTHER PUBLIC AUTHORITY POLICIES ON HAZARD RISK RESTRICTIONS

Is the land affected by an adopted policy (by council, or by another public authority if that authority has notified council that the policy will be included in a planning certificate) that restricts the development of the land due to the likelihood of landslip, bush fire, tidal inundation, subsidence, acid sulphate soils, contamination, aircraft noise, salinity, or any other risk (other than flooding)?

No

11. BUSHFIRE PRONE LAND

Is the land bush fire prone, as designated by the Commissioner of the NSW Rural Fire Service under Section 10.3 of the Act?

Yes - All of the land is identified as bushfire prone.

12. LOOSE FILL ASBESTOS INSULATION

Are there any residential premises on the land registered on the NSW Fair Trading Loose Fill Asbestos Register?

No

13. MINE SUBSIDENCE

Is the land proclaimed to be a mine subsidence district within the meaning of the Mine Subsidence Compensation Act 2017?

No

14. PAPER SUBDIVISION INFORMATION

Is the land subject to a paper subdivision?

No

15. PROPERTY VEGETATION PLANS

Is the land subject to a property vegetation plan under the Native Vegetation Act 2003.

No

16. BIODIVERSITY STEWARDSHIP SITES

Is the land a biodiversity stewardship site under a biodiversity stewardship agreement, including a biodiversity agreement?

No

17. BIODIVERSITY CERTIFIED LAND

Is the land biodiversity certified land?

No

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

Has council been notified of an order made to carry out work in relation to a tree order on the land?

No

19. ANNUAL CHARGES UNDER LOCAL GOVERNMENT ACT 1993 FOR COASTAL PROTECTION SERVICES THAT RELATE TO EXISTING COASTAL PROTECTION WORK

Not applicable

20. WESTERN SYDNEY AEROTROPOLIS

Not applicable

21. DEVELOPMENT CONSENT CONDITIONS FOR SENIORS HOUSING

The land is not land to which State Environmental Planning Policy (Housing) 2021 applies with regards to seniors housing.

Council is not aware whether any terms issued under clause 88(2) of that Policy have been imposed as a condition of development consent granted after 11 October 2007 in relation to the land.

22. SITE COMPATIBILITY CERTIFICATES AND DEVELOPMENT CONSENT CONDITIONS FOR AFFORDABLE RENTAL HOUSING

(1) Council is not aware of a current or former Site Compatibility Certificate (Affordable Rental Housing) apply in respect of proposed development on the land.

(2) *State Environmental Planning Policy (Housing) 2021*, Chapter 2, Part 2, Division 1 or 5 does not apply to the land.

(3) Council is not aware whether any terms issued under conditions of a development consent in relation to the land with regards to affordable rental housing.

CONTAMINATED LAND MANAGEMENT ACT 1997

The following matters are prescribed by Section 59(2) of the Contaminated Land Management Act 1997 to be included on a Planning Certificate. At the date at which this certificate is issued:

(a) the land (or part of the land) to which the certificate relates is significantly contaminated land

No

(b) the land to which the certificate relates is subject to a management order

No

(c) the land to which the certificate relates is the subject of an approved voluntary management proposal

No

(d) the land to which the certificate relates is subject to an ongoing maintenance order

No

(e) the land to which the certificate relates is the subject of a site audit statement

No

21/04/2023

R Pamplin — Date

Department Leader – Development Services

Any request for further information should be directed to council's Development Services Department on (02) 6392 3265, during office hours of 9:00am to 5:00pm.

The above information has been taken from council's records, but council cannot accept responsibility for any omission or inaccuracy. (s.10.7(6) Environmental Planning and Assessment Act 1979).

Appendix 6. Unidentified finds procedure

Unidentified finds procedure

1. Introduction

Residential land-use is proposed for 172 Spring Hill Road, Spring Hill 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

17 Spring Hill Road, Spring Hill 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

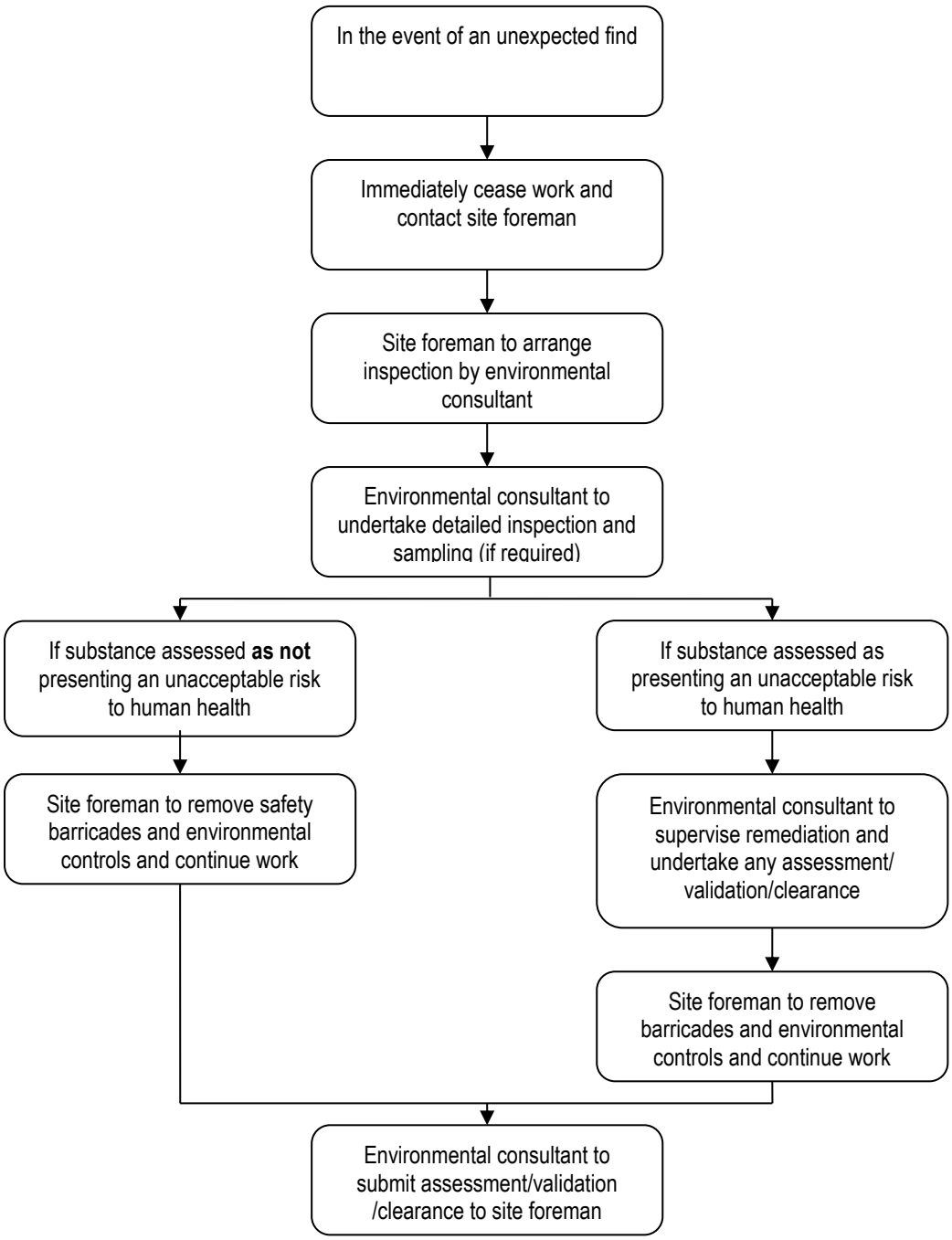
Potential hazards will be identified by appearance and odour include:

- 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.

Information to assist workers in identifying hazards.

BE AWARE

UNEXPECTED HAZARDS MAY BE PRESENT

drums

asbestos

chemical bottles

blood stains

odour

ash / slag

demolition waste

if you <u>SEE</u> or <u>SMELL</u> anything unusual

<u>STOP WORK</u> & contact the Site Foreman

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