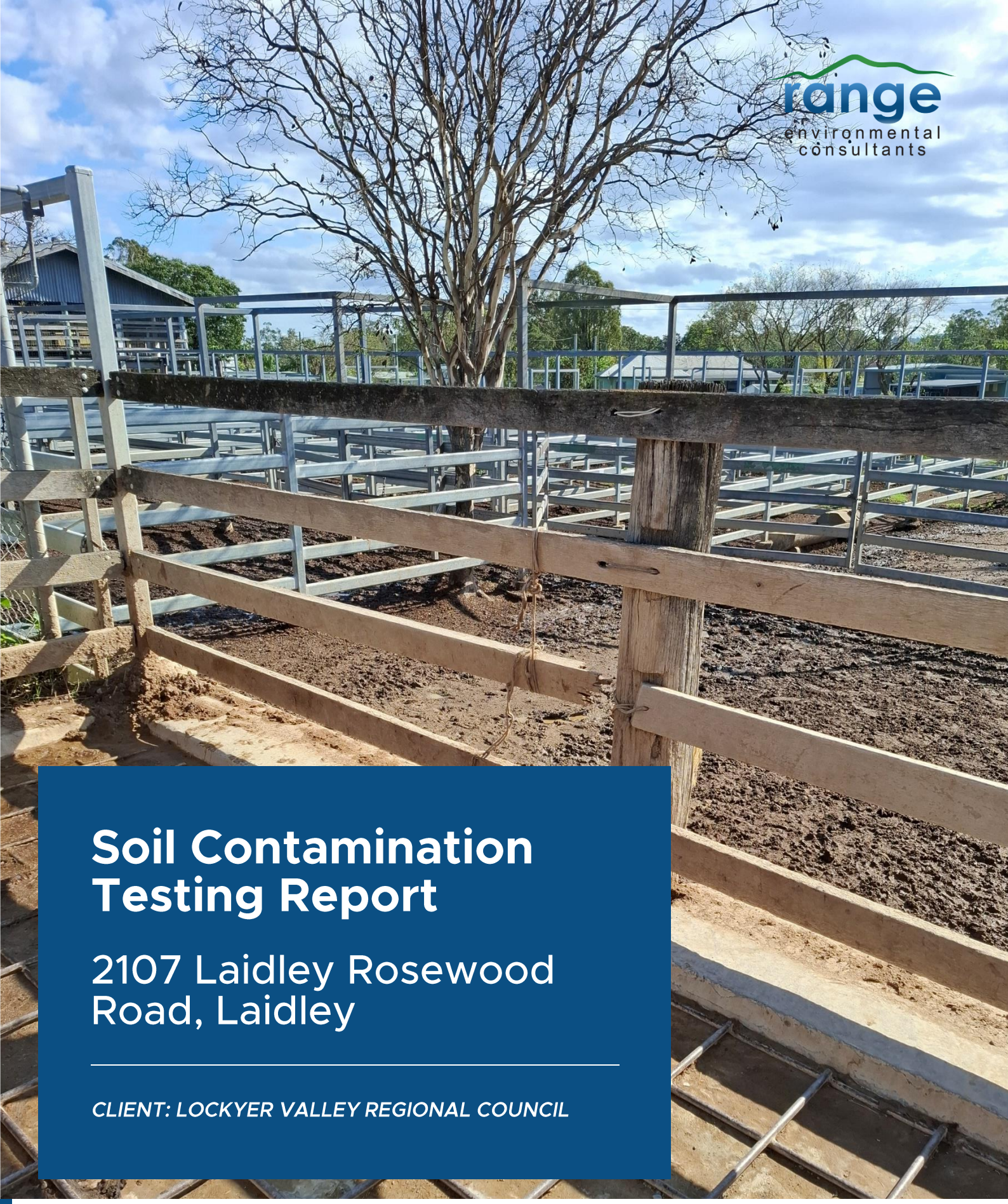

Soil Contamination Testing Report

2107 Laidley Rosewood Road, Laidley

CLIENT: LOCKYER VALLEY REGIONAL COUNCIL

PROJECT NO.	J002075
STATUS	FINAL
DATE	10/10/2024

rangeenviro.com.au

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Document Control

Version	Purpose	Lead Author	Reviewer	Approved by	Date
1.	Final Report	JS	SD	LT	10/10/2024

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1 Introduction

Range Environmental Consultants (Range Environmental) was engaged by Lockyer Valley Regional Council (LVRC) to undertake a preliminary soil contamination testing program that targeted the livestock plunge dip at the Laidley Saleyards. The Laidley Saleyards was located at 2107 Laidley Rosewood Road, Laidley (hereafter 'the site'). The site occurred across nine (9) land parcels formally described as Lots 1 & 4 on SP288143, Lots 5 & 7 on L1742, Lots 407 & 802-804 on L171 and Lot 186 on L1731 (Figure 1). The site had a total area of approximately 1.43 hectares (ha).

Information reviewed as part of this investigation identified that the saleyard operations commenced at the site in approximately 1972. A livestock plunge dip occurred in its current location from approximately 1972 to support the saleyard operations. The livestock plunge dip is still used and is operated by a contractor.

A previous Range Environmental (2023) investigation identified that one (1) of the nine (9) land parcels that comprised the site was known to be included on the Department of Environment, Science, and Innovation's (DESI) Environmental Management Register (EMR). Lot 186 on L1731 was included on the EMR for Notifiable Activity 22 (livestock dip or spray race operations). The previous investigation identified that as of 28 March 2023, no other land parcels that comprised the site were included on the EMR. The review also identified that land parcels were not included on the Contaminated Land Register (CLR) and were not managed under an approved Site Management Plan (SMP).

The LVRC submitted two (2) duty to notify forms to the DESI in May 2023 based on the findings of a previous Range Environmental (2023) investigation. One (1) form notified the DESI that the livestock plunge dip operations were undertaken across three (3) land parcels that comprised the site, including Lots 803 & 804 on L171 and Lot 1 on SP288143. The second form notified the DESI that past releases of effluent contaminated stormwater from the saleyards may have constituted material environmental harm. This investigation was not able to confirm whether the land registers had been updated based on the notifications submitted by the LVRC.

The LVRC required soil contamination testing at potential high-risk areas at and surrounding the livestock dip infrastructure. Potential high-risk areas included the dip, drip pad, holding yards and drainage infrastructure (hereafter 'the investigation area') (Figure 2). The soil contamination testing was required to understand the contamination risk presented to soil at the investigation area by the operation of the livestock plunge dip.

The preliminary soil contamination testing program was undertaken by [redacted] and [redacted] of Range Environmental. [redacted] is a Suitably Qualified Person (SQP) for undertaking contaminated land investigations as required by the relevant provisions under the *Environmental Protection Act 1994* (EP Act).

1.1 Investigation Objectives

The objectives of this targeted soil contamination testing program were to:

- Understand the soil condition at potential high-risk areas at and surrounding the livestock plunge dip infrastructure with regard to contamination.
- Preparation of a preliminary soil contamination testing report (this report).

1.2 Compliance Statement

The soil contamination testing was conducted in general accordance with the following:

- Range Environmental quote Q003169 dated 5 September 2024.
- EP Act.
- National Environmental Protection (Assessment of Site Contamination) Measure 1999 (Amendment No.1) (NEPM) (NEPC, 2013).
- AS4482.1-2005: Guide to Sampling and Investigation of Potentially Contaminated Soil (Part 1: Non-volatile and Semi-volatile Compounds).

- NSW EPA (2022) Contaminated Land Guidelines, including Sampling Design Part 1 (Application) and Sampling Design Part 2 (Interpretation).
- NSW Agriculture (1996). Guidelines for the assessment and Cleanup of Cattle Tick Dip Sites for Residential Purposes.

Australian Standard AS4482.1-2005 had been withdrawn at the time of this investigation. This Australian Standard was still included as it provided a good resource to complement current guidance for contaminated land investigations.

1.3 Site Identification

Particulars of the investigation area are provided in Table 1. A copy of the land register search results are provided at Appendix A.

Table 1 Site particulars

Descriptor	Description			
Location				
Street address	2107 Laidley Rosewood Road, Laidley			
Real property description	Lots 1 & 4 on SP288143.	Lots 5 & 7 on L1742.	Lots 407 & 802-804 on L171.	Lot 186 on L1731.
Central coordinates	Latitude: -27.65126, Longitude:152.39745			
Key features				
Area of investigation area	1.43ha			
Elevation	116-113m Australian Height Datum (AHD)			
Identifying number on the EMR	Not included on the EMR (28 March 2023)			6510
Zoning				
Local Government Area (LGA)	Lockyer Valley Regional Council (LVRC)			
Land use zoning	The above lot and plans were zoned as industry under the Full Lockyer Valley Planning Scheme (v1, effective 22 July 2024).			

Figure 1
Site Locality

Project: Preliminary Investigation

Client: Lockyer Valley Regional Council

Project No.: J002075

Compiled by: MJW Date: 25/09/2024
Approved by: SD Date: 25/09/2024

0 86 172 Metres

Legend

- Roads
- Site boundary

The content of this document includes third party data. Range Environmental Consultants does not guarantee the accuracy of such data.

Source: Cadastral data sourced from DNRME (2024).

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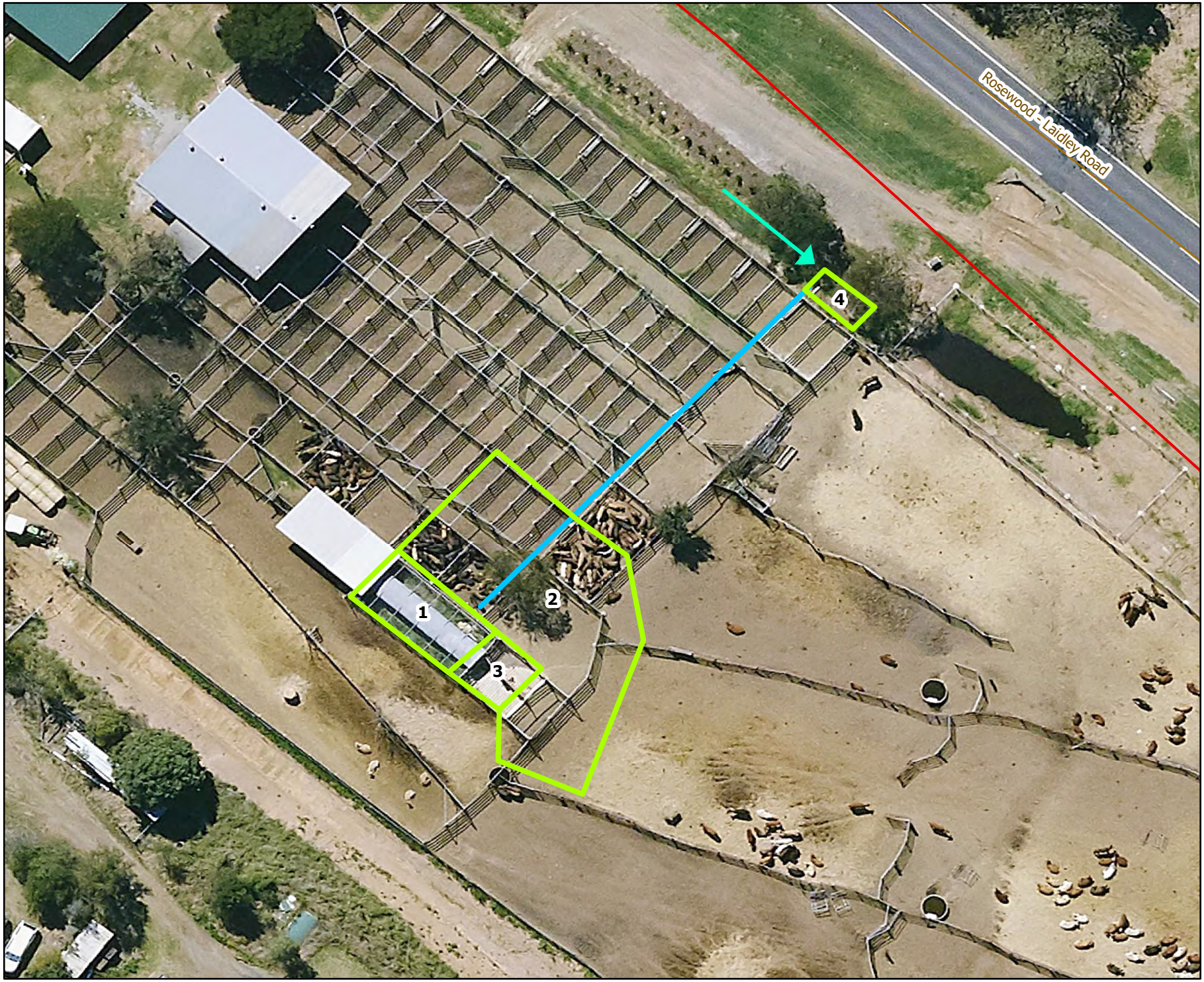

Figure 2 Investigation Area

Project: Preliminary Investigation

Client: Lockyer Valley Regional Council

Project No.: J002075

Compiled by: MJW Date: 10/10/2024
Approved by: LMT Date: 10/10/2024

Metres
0 6.5 13

Legend

- Roads
- Site boundary
- Drainage line
- Earthen channel

Investigation area

- 1 Livestock plunge dip
- 2 Holding/drainage yard
- 3 Drip pad
- 4 Discharge point

Source: Cadastral data sourced from DNRME (2024). Aerial imagery sourced from MetroMap (2024).

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2 Limited Site History and Land Use Analysis

2.1 Approach

The limited site history and land use analysis involved the following:

- Review of historical aerial imagery to identify potential high-risk areas at and surrounding the livestock plunge dip, and to confirm the age of the dip and associated contaminants of potential concern (COPC) (Appendix B).
- Review of the previous Range Environmental (2023) Review of Effluent and Stormwater Management report. Reference: j001362 (Section 2.2).

2.2 Review of Previous Investigations

2.2.1.1 EnviroAg Australia (2022)

A site audit was conducted by EnviroAg Australia (2022) to determine compliance of the site with legislative requirements. The following environmental issues in relation to effluent and stormwater management were identified:

- The dip was leaking and runoff from the drip pad of the dip was evident.
- Due to minimal stormwater and effluent controls at the site, stormwater was mixing with wastewater and effluent from the site and flowing into the receiving environment.
- Effluent that did not leave the site was pooling in multiple locations in the selling pens due to inadequate drainage.
- The stormwater pit located at the northern side of the yards was filled with solid effluent.

2.2.1.2 Range Environmental (2023)

Range Environmental (2023) prepared a report that reviewed effluent and stormwater management for the Laidley Saleyards. The review was conducted in response to uncontrolled released of effluent contaminated stormwater from the site following heavy rainfall events.

Key findings of the Range Environmental (2023) review of relevance to this investigation are summarised below:

- The dip was located at Lots 803 & 804 on L171 and Lot 1 on SP288143. The dip was not located on Lot 186 on L1731.
- Lot 186 on L1731 was listed on the EMR for Notifiable Activity 22. No other land parcels that comprise the site are listed on the EMR.
- The dip was in generally good structural condition. There was however no evidence of cleaning practices for the dip.
    - Sludge from the dip had migrated into the adjoining selling pens.
    - There was evidence that wastes generated at the drip pad had migrated to the adjoining selling pens.

2.3 Review of Historical Aerial Imagery

The review of historical aerial imagery was undertaken to identify potential high-risk areas at and surrounding the investigation areas, and to confirm the age of the dip and associated contaminants of potential concern (COPC). The time periods provided in column 1 of Table 2 are based on the dates of available historical aerial images.

Table 2 Chronology of land use development and activities at the site

Period	Land use activities and development
Pre-1971	**Undeveloped-Rural** • Overstory vegetation occurred within southern portion of site. • Central and northern portions comprised of grassy ground cover. • Rosewood-Laidley Road occurred to the north of the site and comprised of a sealed asphalt road.
1971-1976	**Developed Rural** • Single-story structure (auction house), supporting structure to the west, cattle yards and cattle dip structure occurred in northern portion of the site. • Bare soil was observed to the south-west of the holding yards.
1976-1982	• Large storage shed and laydown area occurred southwest of holding yards. • A second supporting structure occurred to the west of the auction house.
1982-1992	• The unsealed hardstand surrounding the large storage shed was used for the laydown and storage of materials/items. • Small storage shed occurred adjacent to laydown area.
1992-2006	• The laydown area surrounding the large storage shed extended to the east across the site. The laydown area included sealed hardstand in the north and unsealed hardstand in the south. Materials/items were stored at the laydown areas. • Additional infrastructure, including a building, were established at the laydown area.
2006-2016	• Reduction of storage in laydown area was observed. • Materials/items no longer stored at the laydown area. • An overall increase in vegetation was observed across the site.
2016-2024	• Increased ground cover vegetation within central and southern portions occurred. • Additional holding yards occurred to the east of the original yards. • The single-story structure adjacent to holding yards no longer occurred.

3 Background to Livestock Plunge Dips

3.1 Layout of Livestock Plunge Dips

The typical layout of a livestock plunge dip and associated infrastructure is shown in Figure 3. Typical dipping practices and infrastructure are summarised below:

- Dip sites generally comprised a holding yard where animals are kept prior to entering the force pen and crush area.
- Once the animals are contained within the crush area, they progressed through an inground plunge dip.
- The animals are typically physically submerged in the dip liquid as they progressed through the dip.
- The animals exit the dip and are held in a draining pad to allow for the drainage of excess liquid. The draining pads could include bunded concrete slabs.
- The animals are then generally held in draining yards where any residual dip solution is allowed to drain off the animal (Kimber et al., 2002).
- Sediment build-up in the dip should be physically removed. Generally, sediment was then historically generally disposed of at mounds or disposal pits within proximity to the dip infrastructure.
- A shed generally occurred at the dip location to store dip chemicals.

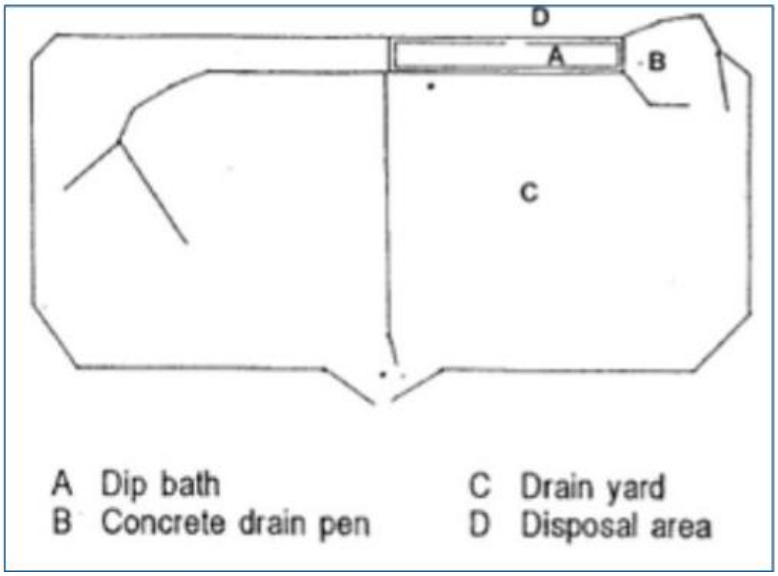


Figure 3 Typical layout of a livestock plunge dip (NSW Agriculture, 2006)

3.2 Contaminant Occurrence

NSW Agriculture (1996) identified the following areas as presenting the highest potential risk of contamination at dip sites:

- Splash areas adjacent to both sides of the plunge dip.
- Beneath the dip.
- Surge areas adjacent to the crush.
- Draining pen where dripping of stock may have occurred.
- Draining yard where disposal of chemicals may have occurred.
- Scooping mounds or disposal pits adjacent to the plunge dip.
- Areas where contaminated soils may have been relocated.
- Chemical storage area.

3.2.1.1 Contaminants of Potential Concern

Table 3 describes the chemicals typically used at livestock plunge dips and periods of use (NSW Agriculture, 1996).

Table 3 Chemicals used at livestock plunge dips.

Chemical	General period of use
Arsenic	1840s-1955
Dichlorodiphenyltrichloroethane (DDT)	1955-1962
Benzene hexachloride (BHC)	1955-1962
Carbaryl	1963-1970
Coumaphos	1962-1970
Carophenothion	1962
Chlorpyrifos	1969-1974
Bromophos ethyl	1969
Dioxothion	1962-1976
Ethion	1962-1976
Chlordimeform	1973-1976
Amitraz	1976-present
Promacyl	1977-1992
Cypermethrin & Chlorfenvinphos	1979-present
Flumethrin	1986-present

Arsenic and DDT are the most common contaminants at dip sites due to their persistence in the environment (NSW Agriculture, 1996). Arsenic was the first known chemical used to treat cattle ticks and was widely used in Australia from 1895 until approximately 1955 following the development of DDT (NSW Agriculture, 1996 and Avcare Limited, 2005). DDT was then used from 1955 until approximately 1962 (NSW Agriculture, 1996).

Organic dip chemicals that were introduced prior to 1964 included carbamates and organophosphates (Avcare Limited, 2005).

Organic dip chemicals were introduced prior to 1964 and included carbamates and organophosphates (Avcare, 2005). Ethion, Chlordimeform, Amitraz, Promacyl, Cypermethrin, Chlorfenyinphos, and Flumethrin were chemicals that were likely used in livestock plunge dips from 1962 until present (NSW Agriculture).

Synthetic pyrethroids were introduced in the 1980s. Pesticide data for market gardens shows that carbamates, organophosphates and synthetic pyrethroids are not considered major soil contaminants as they are generally not persistent and decompose in the soil within a year of release (NSW DEC, 2005).

4 Condition of the Investigation Area

An inspection of the investigation area and surrounds was undertaken by [redacted] and [redacted] on 13 September 2024.

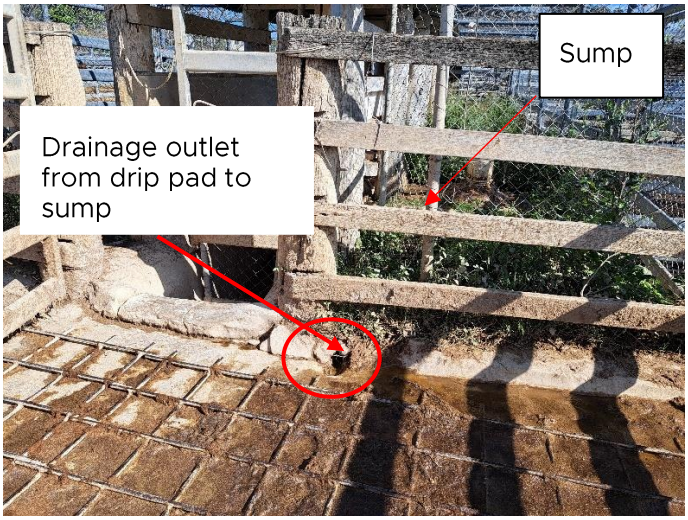
- Photographs and descriptions of land uses and activities and aboveground infrastructure at the investigation area are provided in Table 4.
- The potential high-risk areas that comprise the investigation area are shown at Figure 2. These areas included the dip, drip pad, holding yards and drainage infrastructure.

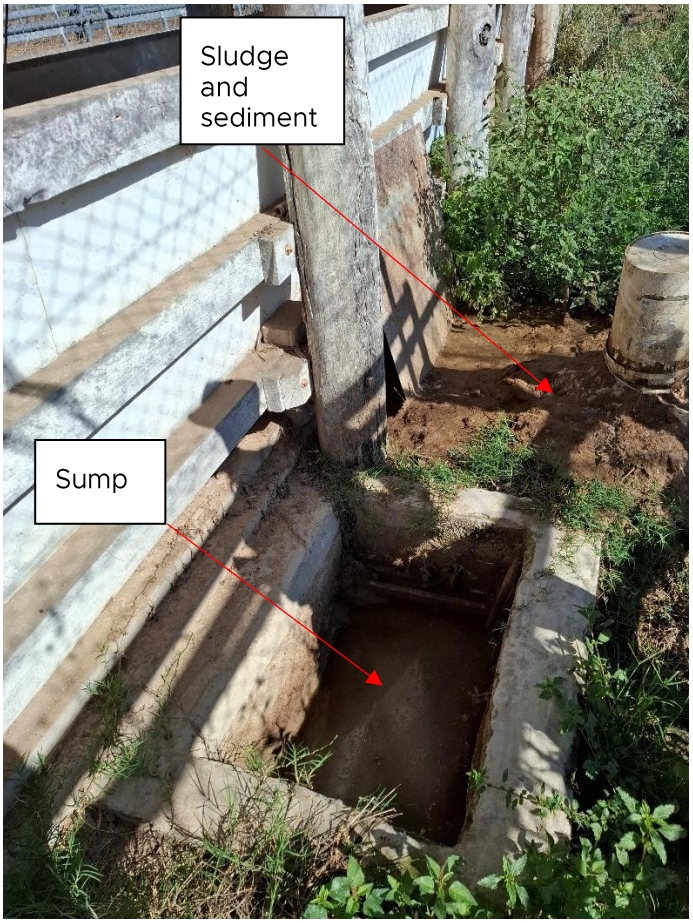
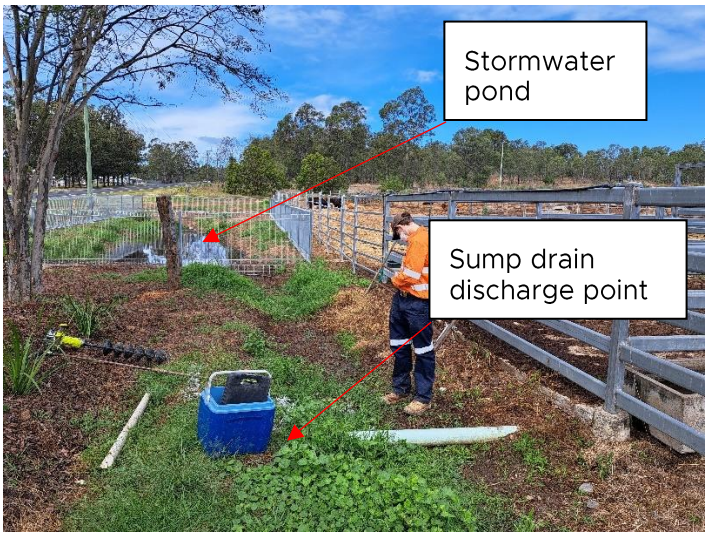
Table 4 Photographs and descriptions of the site

Photograph	Description

 View to the southeast of plunge dip	• The site comprised of a livestock plunge dip and adjoining cattle yards. On the date of the site inspection, the cattle dip had been used the two (2) days prior (11 September 2024) and was full of dipping liquid.
	• The dip was approximately 13m x 1m x 2.3m and was oriented northwest to southeast.
	• Metal sheeting extended from the top of the concrete walls and extended aboveground >1m. This metal sheeting provided splash protection to the surrounding soil.
	• There was evidence of overflow liquid and sediment from dip being discharged.
	• Visible damage to the dip and associated structure noted by Kehoe Myers Consulting Engineers (2024[1]) included:
	  ◦ Visible cracks in concrete structure of the dip.
	  ◦ Holes in metal dip wall sheeting providing routes of exit for dip liquid when splashing occurs.
	  ◦ Timber joists in poor condition with visible decay in areas.

[1] Kehoe Myers Consulting Engineers. 2024. Engineering Investigation Report – Laidley Saleyards Cattle Dip. Project No. S2324164.

Photograph	Description
 Chemical containers on western side of plunge dip.	• Empty containers of tickacides including Exitraz and Amitik (chemicals are in powder form) occurred adjacent to the dip. • Safety Data Sheets (SDS) identified Amitraz as the active ingredient present in Amitik and Exitraz. Amitraz is a non-systemic acaricide. A copy of the SDS sheets is provided in Appendix C. • An SDS for Amitraz (12.5%) liquid formulation prepared by Merck (2023) identified that other substances in Amitraz included C_{10} hydrocarbons, naphthalene (50-70% w/w) and phenols (10-20% w/w). • Labels for the containers described that Amitraz is suitable for the control of organophosphate and synthetic pyrethroid resistant ticks. • [redacted] of LVRC advised on 12 September 2024 that Exitraz had been used for quite some time at the dip.
 View to the northwest of the bunded drainage pad	• A concrete drip pad occurred at the exit of the dip. • The drip pad was bunded with concrete. A drainage outlet occurred in the western wall of the concrete bund. This outlet connected the drip pad to a sump. • The outlet did not occur at the lowest point at the drip pad. Liquid was pooled in the northern corner of the drip pad. • Sediment buildup and wet soils in the holding yard indicated that liquid from the drip pad overflowed into the holding yards to the north. • The land at the site sloped north towards Rosewood-Laidley Road.

Photograph	Description
 Sump and sludge on the eastern side of the dip.	• The outlet from the drip pad was intended to direct liquid to a concrete sump on the eastern side of the dip. • The sump could be used to direct dip fluid back into the dip, or direct stormwater from the drip pad away from the dip. • A steel drain line ran underground from the sump to the northwest towards Rosewood-Laidley Road. The discharge point for the drain line was an earthen drain that was used to control runoff from the saleyards. • A disposal area for sediment and sludge from the dip or sump occurred along the eastern side of the dip.
 View to the south of the sump drain line where it discharges into an earthen drain.	• The sump drain discharged into the earthen drainage line near Rosewood-Laidley Road. • The earthen drainage line directed runoff from the saleyards to the southeast to an earthen stormwater pond.

4.1 Local Soil Condition

The local soil conditions encountered at the investigation area during the soil contamination testing program are described in the bore logs provided in Appendix D and summarised below in Table 5.

Table 5 Summary of local soil conditions encountered at the investigation areas

Item	Description
Capping	• No capping occurred at the site.
Fill	• Fill was generally described as brown silty clay with medium plasticity. Fill material was considered to be reworked natural with bluestone road base (SS1-SS5). Fill extended to a depth of 0.35 metres below ground level (mbgl).
Natural	• Natural soils were described as grey, brown, yellow brown, or yellow, red brown clays to approximately 0.8mbgl.
Bedrock	• Bedrock was not encountered by this investigation.
Groundwater	• Groundwater was not encountered during this investigation.
Potential indicators of contamination.	• Sediment and sludge generated as part of the livestock plunge dip operations occurred at the investigation area (Table 4). • There were no other visual and olfactory indicators of contamination encountered during this investigation.

5 Areas of Environmental Concern

Four (4) Areas of Environmental Concern (AEC) were identified in relation to the plunge dip. The AEC and Contaminants of Potential Concern (COPC) are described in Table 6 and shown in Figure 2.

Table 6 Classification of areas as AEC

AEC	Justification for classification as AEC	COPC	Environmental media
1. Livestock plunge dip. 2. Holding/ drainage yards. 3. Drip pad. 4. Discharge point.	The historic and current use of tickicide chemicals may have caused localised soil contamination. • COPC may have been released to soils surrounding the dip due to splashes and overflow, leakage from cracks in the dip walls or storage of sludge/sediment along the eastern side of the dip (AEC 1). • Dip liquids may have been released to soils at the drainage/holding yards from runoff from the dip and from wet livestock after dipping (AEC 2). • Dip liquid may have overflowed to downgradient extents from the drip pad due to poor design and management (AEC 3). • COPC may have been released at the discharge point from the sump into the earthen drainage line near Rosewood-Laidley Road.	Arsenic, Organochlorine (OC) pesticides (commonly occurring and persistent dip chemicals) Total Recoverable Hydrocarbons (TRH) (C_6-C_{10}), Benzene, Toluene, Ethylbenzene, Xylenes and Naphthalene (BTEXN) and Phenols (as indicator chemicals for Amitraz/Exitraz/Amitik)	Soil

6 Sampling & Analysis Quality Plan

The soil sampling program was undertaken by [redacted] and [redacted] on 13 September 2024.

6.1 Target Media

Soil was targeted by this investigation as it was considered at the greatest risk of impact by the livestock plunge dip operations (NSW Agriculture, 1996).

6.2 Contaminants of Potential Concern

The laboratory analysis program targeted Contaminants of Potential Concern (COPC) associated with the AEC identified in Section 5. COPC included arsenic, OC pesticides, TRH (C_6-C_{10}), BTEXN and phenols.

6.3 Investigation Levels

6.3.1 Low-density Residential Land Use

Soil contaminant concentrations were compared with the low-density residential land use (i.e., most sensitive) human health and ecological screening criteria in the National Environment Protection Measure (NEPM 2013). This was to understand whether the condition of the site required notification for hazardous contaminants. The following soil screening criteria from NEPC (2013) were used:

- Health-based Investigation Levels Resident A (HIL A).
- Generic Ecological Investigation Level (Urban Residential and Public Open Space) (Generic EIL).
- Ecological Screening Level (ESL) (Urban Residential and Public Open Space).

6.4 Soil Sampling Strategy

The preliminary soil sampling and analysis program is described below in Table 7. Sample locations are shown in Figure 4.

Table 7 Soil sampling and analysis program

Descriptor	Description
Sample density	• Nine (9) sample points were targeted at the investigation area.
Sample method	• Four (4) boreholes were excavated using a combination of a hand auger and battery auger. • An additional five (5) surface soil samples were collected using a battery-operated hand auger. Once excavated samples were collected directly by hand.
Sample depths	• Surface samples were collected at depth of 0-0.15 mbgl. • Borehole samples were collected at depths that were determined in the field to a maximum depth of 1 mbgl.
Sample locations	• Boreholes BH1, BH2 and BH3 and surface soil sample SS5 were selected to target soils at the walls of the livestock plunge dip. The locations targeted risks presented by splashing of dip liquid, sludge disposal and from leaks from cracks in the dip walls (boreholes only) (AEC 1). • Borehole BH3 was also selected adjacent to the concrete sump (AEC 1). • Borehole BH4 targeted the sump drain line discharge point in the earthen drain (AEC 4).

	• Surface samples SS1-SS4 targeted the drainage/holding yards (AEC 2) and areas downgradient of the drip pad (AEC 3).
Sample analysis	• All samples were subject to laboratory analysis for arsenic, OC pesticides, TRH (C_6-C_{10}) and BTEXN. Selected samples were tested for phenols.

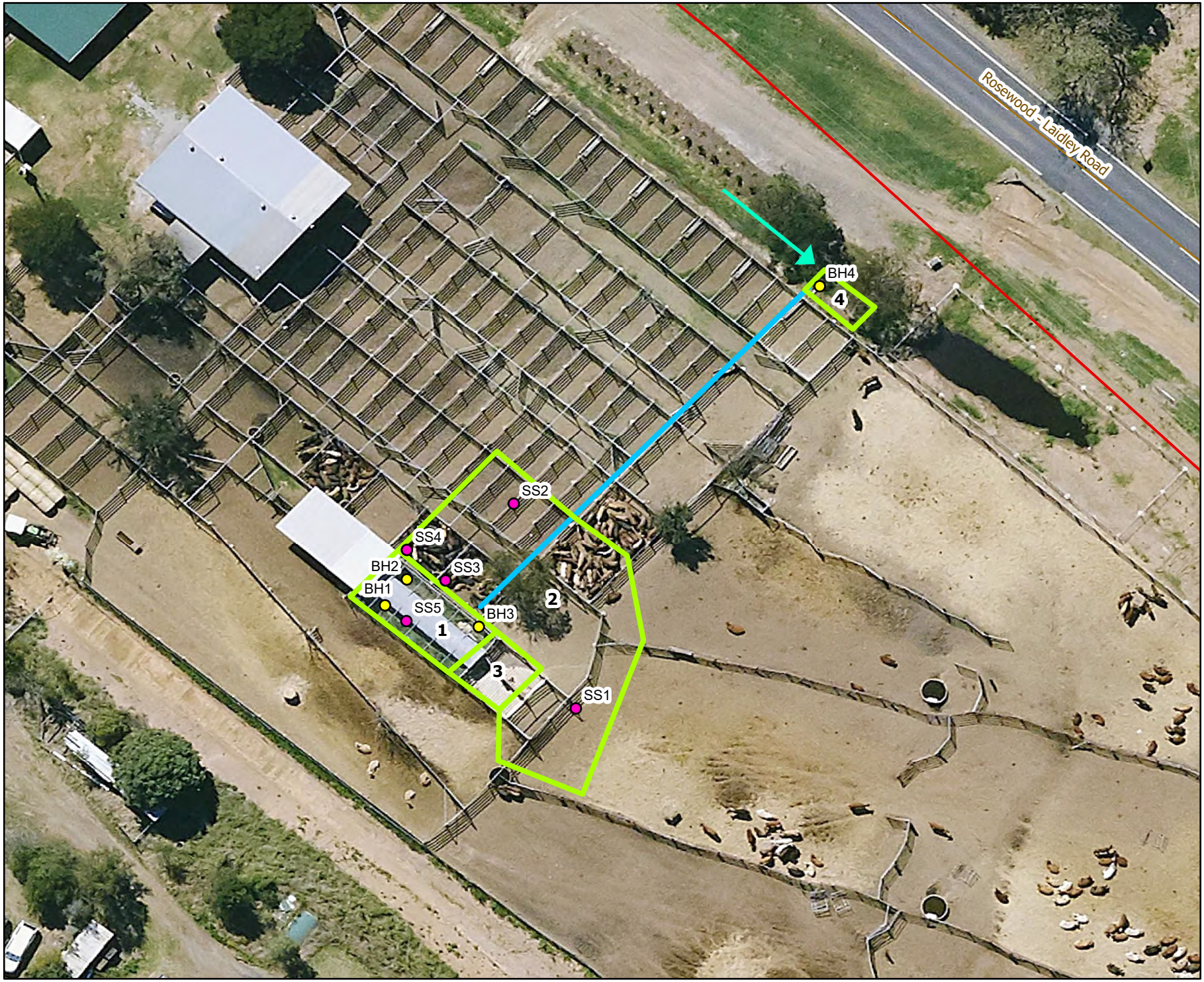


Figure 4 Sample locations

Project: Preliminary Investigation

Client: Lockyer Valley Regional Council

Project No.: J002075

Compiled by: MJW Date: 10/10/2024
Approved by: LMT Date: 10/10/2024

Metres
0 6.5 13

Legend

- Roads
- Site boundary
- Drainage line
- Earthen channel

Investigation area

- 1 Livestock plunge dip
- 2 Holding/drainage yard
- 3 Drip pad
- 4 Discharge point

Sample locations

- Boreholes
- Surface samples

Source: Cadastral data sourced from DNRME (2024). Aerial imagery sourced from MetroMap (2024).

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7 Quality Assurance (QA) & Quality Control (QC)

7.1 Field QA/QC Protocols

The field QA/QC protocols adopted for the investigation are summarised below:

- The site inspection and soil sampling program were undertaken by an SQP for undertaking contaminated land investigations.
- Disposable nitrile gloves were worn at all times and changed after the collection of each single sample to prevent cross-contamination.
- Excavation equipment (e.g., battery-operated auger) are relatively difficult to decontaminate and it was therefore necessary to opt for a simpler sampling system. As per section 8.2.4.3 of NEPM (2013), a simpler sampling system described below was adopted to avoid potential cross contamination was considered suitable.
    - The auger bits were visually inspected after each borehole to ensure they were free of soil clods before moving to the next sample point.
- Non-disposable sampling instruments (i.e., hand auger, half poly pipe and trowel) were decontaminated after every use. This involved scrubbing with water and rinsing in clean water then a final rinse with deionised water.
- Soil samples were placed into laboratory-supplied glass jars with no headspace to minimise the loss of volatiles.
- Additional samples were collected for field quality control purposes. These included:
    - One (1) intra-laboratory blind duplicate (Dup-1) and one (1) inter-laboratory (Trip-1) samples were collected from the primary sample (SS4) and were subject to laboratory analysis for arsenic OC pesticides, TRH (C_6-C_{10}), and BTEXN.
- Samples were kept in an ice-packed esky at all times and transported directly to the National Association of Testing Authorities (NATA) accredited analytical laboratory (ALS Stafford (QLD), ALS Smithfield (NSW)).
- Standardised field forms were used to document key information for each borehole excavated, including borehole logs, sample depths and labelling (Appendix D).
- Chain of Custody (COC) forms were provided with samples.

7.2 Laboratory QA/QC Protocols

- Analyses were performed by two (2) ALS laboratories, including Stafford (QLD) and Smithfield (NSW). All laboratories are NATA-accredited for the requested analytes.
- Laboratory QA/QC protocols included method blanks, laboratory control samples, laboratory duplicates and matrix spikes.
- Laboratory documentation is provided in Appendix E.

8 Quality Assurance & Quality Control Results

8.1 Field QA/QC Results

- No analysis holding time or sample preservation non-compliances were reported by ALS Stafford (QLD), ALS Smithfield).
- Field QC samples were collected at the required rates (1:17 samples).
- Samples were received with ice present, confirming that sample preservation methods were adhered to (2.3 and 4.3°C).
- There were no exceedances of the Relative Percentage Difference (RPD) thresholds between the primary sample (SS4) and the field duplicate (Dup-1) or field triplicate (Trip-1) samples.

8.2 Laboratory QA/QC Results

8.2.1 ALS Stafford

Batch EB2431818

- No method blank, laboratory control, matrix spike, surrogate recovery, analysis holding time, or quality control frequency outliers occurred.

8.2.2 ALS Smithfield

Batch ES2430750

- No method blank, laboratory control, matrix spike, duplicate, surrogate recovery, analysis holding time, or quality control frequency outliers occurred.

8.3 Data Quality Evaluation

The data quality evaluation results demonstrate that the data obtained from this sampling and analysis program is of acceptable quality to make a preliminary assessment of the soil contamination risk presented by livestock plunge dip operations.

9 Results & Discussion

Laboratory certificates of analysis are provided in Appendix E. A summary of the analytical results and comparison with the investigation levels are provided in Appendix F.

9.1 Organic contaminants

The reported concentrations of OC pesticides, BTEXN, TRH (C_6-C_{10}) and phenols did not exceed the applied low-density residential investigation levels for any sample analysed.

9.2 Inorganic contaminants

The reported concentrations of arsenic did not exceed the applied low-density residential investigation levels for any sample analysed.

9.3 Synthesis

Almost all samples reported concentrations of the targeted contaminants below the Limit of Reporting (LOR) (i.e. contaminants could not be detected in the soil samples). The dip was found to present a low risk of soil contamination as targeted contaminants did not exceed the relevant investigation levels. This is not uncommon for dips where non-persistent dip chemicals (i.e. Amitraz) are used. Contamination at livestock dips typically occurs at older dips (i.e. pre-1960s) where persistent dip chemicals such as arsenic or DDT may have been used.

10 Summary

- Range Environmental Consultants (Range Environmental) was engaged by Lockyer Valley Regional Council (LVRC) to undertake a preliminary soil contamination testing program that targeted the livestock plunge dip at the Laidley Saleyards.
- The LVRC required soil contamination testing at potential high-risk areas at and surrounding the livestock dip infrastructure. Potential high-risk areas include the plunge dip, drip pad, holding yards and drainage infrastructure.
- Information reviewed as part of this investigation identified that the saleyard operations commenced at the site in approximately 1972. A livestock plunge dip occurred in its current location from approximately 1972. The livestock plunge dip is still used and is operated by a contractor.
- Exitraz (an Amitraz based tick control chemical) is used in the dip and has been for some time.
- A preliminary soil sampling and analysis program was undertaken on the 13 September 2024. For all contaminants targeted by the preliminary soil sampling program, the reported concentrations did not exceed the assessment criteria of the applied human and ecological investigation levels for low-density residential land use (i.e., the most sensitive land use scenario).
- The findings of this limited soil testing program did not indicate any evidence of soil contamination associated with the operation of the livestock plunge dip. This is not uncommon for dips where non-persistent dip chemicals (i.e. Amitraz) are used.

10.1 Data Gaps

Due to the preliminary nature of this investigation, there are data gaps and uncertainties that were not able to be fully assessed as part of this investigation. Data gaps included:

- The occurrence of aboveground and belowground infrastructure constrained the assessment of all potentially affected environmental media. For example, subslab soils beneath the drip pad and beneath the livestock plunge dip were not able to be targeted by this preliminary soil contamination testing program.
- The soil contamination testing program was preliminary only. A more detailed investigation of soil at the investigation is recommended if the LVRC require a more comprehensive understanding of the contamination risk presented by the livestock plunge dip operations at the site.

Appendices

Appendix A Land Register Search Results

Department of Environment and Science (DES)
ABN 46 640 294 485
400 George St Brisbane, Queensland 4000
GPO Box 2454, Brisbane QLD 4001, AUSTRALIA
www.des.qld.gov.au

SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Madeline Warnick
Unit 1, 7 Birubi Street
Coorparoo QLD 4151

Transaction ID: 50848330 EMR Site Id: 28 March 2023
Cheque Number:
Client Reference:

This response relates to a search request received for the site:
Lot: 1 Plan: SP288143
2107 ROSEWOOD LAIDLEY RD
LAIDLEY

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated.
The EMR/CLR does NOT include:-

1. land which is contaminated land (or a complete list of contamination) if DES has not been notified
2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities) if DES has not been notified

If you have any queries in relation to this search please email emr.clr.registry@des.qld.gov.au

Administering Authority

Department of Environment and Science (DES)
ABN 46 640 294 485
400 George St Brisbane, Queensland 4000
GPO Box 2454, Brisbane QLD 4001, AUSTRALIA
www.des.qld.gov.au

SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Madeline Warnick
Unit 1, 7 Birubi Street
Coorparoo QLD 4151

Transaction ID: 50848329 EMR Site Id: 28 March 2023
Cheque Number:
Client Reference:

This response relates to a search request received for the site:
Lot: 4 Plan: SP288143
2107 ROSEWOOD LAIDLEY RD
LAIDLEY

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated.
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SEARCH RESPONSE

ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Madeline Warnick
Unit 1, 7 Birubi Street
Coorparoo QLD 4151

Transaction ID: 50848328 EMR Site Id: 28 March 2023
Cheque Number:
Client Reference:

This response relates to a search request received for the site:

Lot: 7 Plan: L1742
ROSEWOOD LAIDLEY RD
LAIDLEY

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated.
The EMR/CLR does NOT include:-

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Administering Authority

Department of Environment and Science (DES)
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SEARCH RESPONSE

ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Madeline Warnick
Unit 1, 7 Birubi Street
Coorparoo QLD 4151

Transaction ID: 50848327 EMR Site Id: 28 March 2023
Cheque Number:
Client Reference:

This response relates to a search request received for the site:

Lot: 5 Plan: L1742
ROSEWOOD LAIDLEY RD
LAIDLEY

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated.
The EMR/CLR does NOT include:-

1. land which is contaminated land (or a complete list of contamination) if DES has not been notified
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SEARCH RESPONSE

ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Madeline Warnick
Unit 1, 7 Birubi Street
Coorparoo QLD 4151

Transaction ID: 50848326 EMR Site Id: 28 March 2023
Cheque Number:
Client Reference:

This response relates to a search request received for the site:

Lot: 804 Plan: L171
ROSEWOOD LAIDLEY RD
LAIDLEY

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated.
The EMR/CLR does NOT include:-

1. land which is contaminated land (or a complete list of contamination) if DES has not been notified
2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities) if DES has not been notified

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Administering Authority

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SEARCH RESPONSE

ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Madeline Warnick
Unit 1, 7 Birubi Street
Coorparoo QLD 4151

Transaction ID: 50848325 EMR Site Id: 28 March 2023
Cheque Number:
Client Reference:

This response relates to a search request received for the site:

Lot: 803 Plan: L171
ROSEWOOD LAIDLEY RD
LAIDLEY

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated.
The EMR/CLR does NOT include:-

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SEARCH RESPONSE

ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Madeline Warnick
Unit 1, 7 Birubi Street
Coorparoo QLD 4151

Transaction ID: 50848324 EMR Site Id: 28 March 2023
Cheque Number:
Client Reference:

This response relates to a search request received for the site:

Lot: 802 Plan: L171
ROSEWOOD LAIDLEY RD
LAIDLEY

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated.
The EMR/CLR does NOT include:-

1. land which is contaminated land (or a complete list of contamination) if DES has not been notified
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GPO Box 2454, Brisbane QLD 4001, AUSTRALIA
www.des.qld.gov.au

SEARCH RESPONSE

ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Madeline Warnick
Unit 1, 7 Birubi Street
Coorparoo QLD 4151

Transaction ID: 50848323 EMR Site Id: 28 March 2023
Cheque Number:
Client Reference:

This response relates to a search request received for the site:

Lot: 801 Plan: L171
ROSEWOOD LAIDLEY RD
LAIDLEY

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated.
The EMR/CLR does NOT include:-

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SEARCH RESPONSE

ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Madeline Warnick
Unit 1, 7 Birubi Street
Coorparoo QLD 4151

Transaction ID: 50848322 EMR Site Id: 28 March 2023
Cheque Number:
Client Reference:

This response relates to a search request received for the site:

Lot: 407 Plan: L171
ROSEWOOD LAIDLEY RD
LAIDLEY

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated.
The EMR/CLR does NOT include:-

1. land which is contaminated land (or a complete list of contamination) if DES has not been notified
2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities) if DES has not been notified

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SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Madeline Warnick
Unit 1, 7 Birubi Street
Coorparoo QLD 4151

Transaction ID: 50848321 EMR Site Id: 6510 28 March 2023
Client Reference:
Cheque Number:

This response relates to a search request received for the site:
Lot: 186 Plan: L1731

EMR RESULT

The above site IS included on the Environmental Management Register.
Lot: 186 Plan: L1731
Address: LAIDLEY-ROSEWOOD ROAD
LAIDLEY 4341

The site has been subject to the following Notifiable Activity or Hazardous Contaminant.
LIVESTOCK DIP OR SPRAY RACE - operating a livestock dip or spray race facility.

For the majority of rural properties only a small area may be affected by the chemicals used in livestock dips and spray races. The Department of Environment and Science may hold further information relating to the location of the dip site within this property.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated.
The EMR/CLR does NOT include:-

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2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities) if DES has not been notified

If you have any queries in relation to this search please email emr.clr.registry@des.qld.gov.au

Administering Authority

Appendix B Historical Aerial Imagery

Appendix B Historical Aerial Imagery 1971

Project: Preliminary Investigation

Client: Lockyer Valley Regional Council

Project No.: J002075

Compiled by: MJW Date: 24/09/2024
Approved by: SD Date: 24/09/2024

Metres
0 55 110

Legend

Site boundary

Source: Cadastral data sourced from DNRME (2024). Aerial imagery sourced from QImagery (2024).

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Appendix B Historical Aerial Imagery 1976

Project: Preliminary Investigation

Client: Lockyer Valley Regional Council

Project No.: J002075

Compiled by: MJW Date: 25/09/2024
Approved by: SD Date: 25/09/2024

Metres
0 55 110

Legend

Site boundary

Source: Cadastral data sourced from DNRME (2024). Aerial imagery sourced from QImagery (2024).

N

range environmental consultants

Appendix B Historical Aerial Imagery 1982

Project: Preliminary Investigation

Client: Lockyer Valley Regional Council

Project No.: J002075

Compiled by: MJW Date: 24/09/2024
Approved by: SD Date: 24/09/2024

0 55 110 Metres

Legend

Site boundary

Source: Cadastral data sourced from DNRME (2024). Aerial imagery sourced from QImagery (2024).

N

range environmental consultants

Appendix B Historical Aerial Imagery 1992

Project: Preliminary Investigation

Client: Lockyer Valley Regional Council

Project No.: J002075

Compiled by: MJW Date: 25/09/2024
Approved by: SD Date: 25/09/2024

0 55 110 Metres

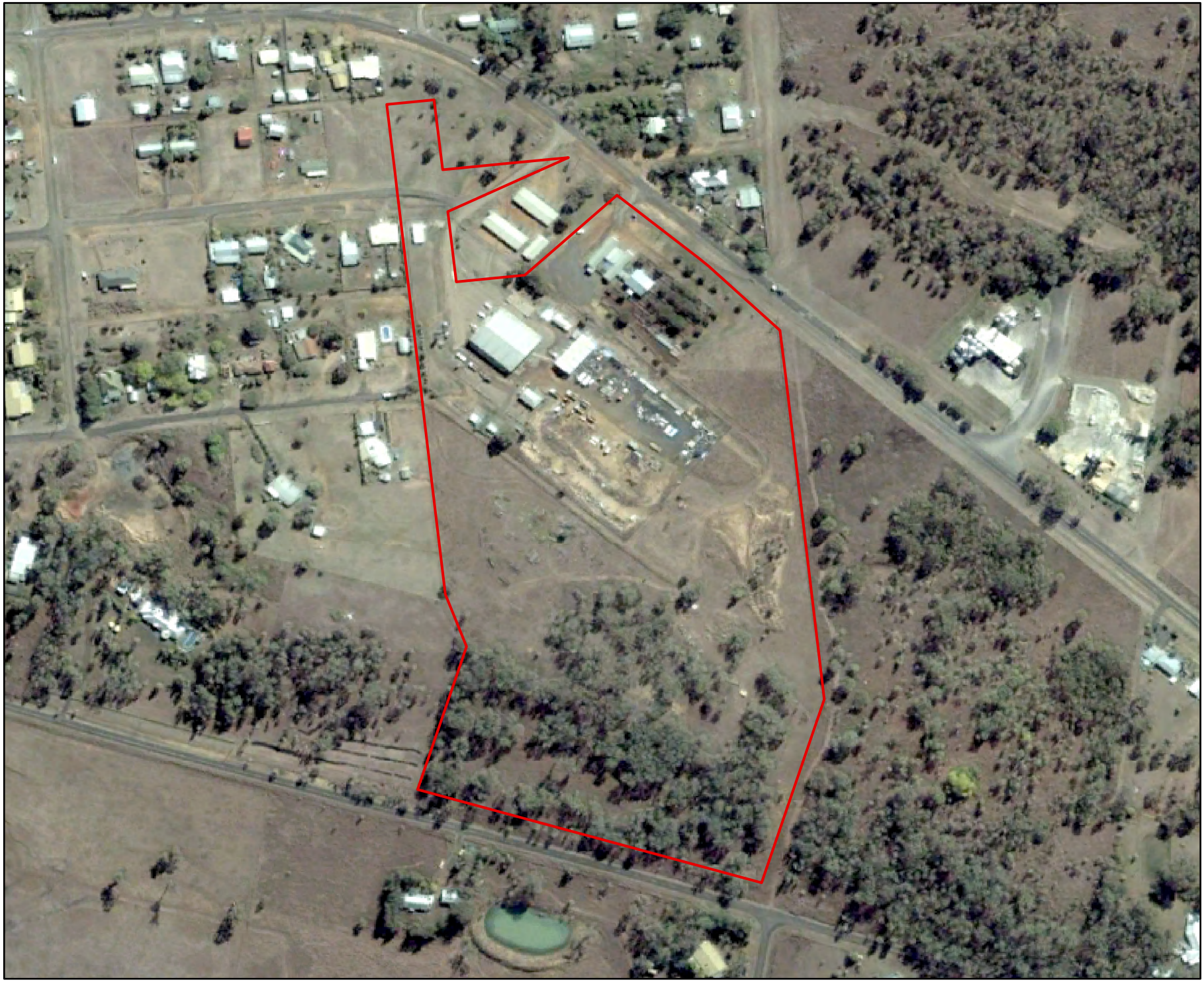
Legend

Site boundary

Source: Cadastral data sourced from DNRME (2024). Aerial imagery sourced from QImagery (2024).

N

range environmental consultants



Appendix B Historical Aerial Imagery 2006

Project: Preliminary Investigation

Client: Lockyer Valley Regional Council

Project No.: J002075

Compiled by: MJW Date: 25/09/2024
Approved by: SD Date: 25/09/2024

Metres
0 46 92

Legend

Site boundary

Source: Cadastral data sourced from DNRME (2024). Aerial imagery sourced from Google Earth (2024).

N

range environmental consultants

Appendix B Historical Aerial Imagery 2016

Project: Preliminary Investigation

Client: Lockyer Valley Regional Council

Project No.: J002075

Compiled by: MJW Date: 25/09/2024
Approved by: SD Date: 25/09/2024

0 46 92 Metres

Legend

Site boundary

The content of this document includes third party data. Range Environmental Consultants does not guarantee the accuracy of such data.

Source: Cadastral data sourced from DNRME (2024). Aerial imagery sourced from Google Earth (2024).

N

range environmental consultants

Appendix B
Aerial Imagery 2024

Project: Preliminary Investigation

Client: Lockyer Valley Regional Council

Project No.: J002075

Compiled by: MJW Date: 25/09/2024
Approved by: SD Date: 25/09/2024

Metres
0 46 92

Legend

Site boundary

Source: Cadastral data sourced from DNRME (2024). Aerial imagery sourced from MetroMap (2024).

N

range environmental consultants

Appendix C Safety Data Sheets

SAFETY DATA SHEET

Amitraz (50%) Solid Formulation

Version	Revision Date:	SDS Number:	Date of last issue: -
1.0.AU	09.04.2022	10650591-00001	Date of first issue: 09.04.2022

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : COOPERS AMITIK CATTLE DIP AND SPRAY (APVMA 41044)
Amitraz (50%) Solid Formulation

Manufacturer or supplier's details

Company : Intervet Australia Pty Limited (trading as MSD Animal Health - ABN 79 008 467 034

Address : 91-105 Harpin Street
Bendigo 3550, Victoria Austrailia

Telephone : 1 800 033 461

Emergency telephone number : Poisons Information Centre: Phone 13 11 26 from anywhere in Australia

E-mail address : EHSDATASTEWARD@msd.com

Recommended use of the chemical and restrictions on use

Recommended use : Veterinary product

Restrictions on use : Not applicable

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Acute toxicity (Oral) : Category 4

Serious eye damage/eye irritation : Category 1

Skin sensitisation : Category 1

Germ cell mutagenicity : Category 2

Carcinogenicity : Category 1B

Specific target organ toxicity - repeated exposure : Category 2 (Liver, Central nervous system)

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : H302 Harmful if swallowed.

H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H341 Suspected of causing genetic defects.
H350 May cause cancer.
H373 May cause damage to organs (Liver, Central nervous system) through prolonged or repeated exposure.

Precautionary statements :

Prevention:

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe dust.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.
P302 + P352 IF ON SKIN: Wash with plenty of water.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.

Storage:

P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards which do not result in classification

May form explosive dust-air mixture during processing, handling or other means.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	CAS-No.	Concentration (% w/w)
amitraz (ISO)	33089-61-1	>= 30 -< 60
Calcium carbonate	471-34-1	>= 30 -< 60
Nonylphenol, ethoxylated	9016-45-9	>= 1 -< 3
Paraformaldehyde	30525-89-4	>= 1 -< 3

SECTION 4. FIRST AID MEASURES

General advice	:	In the case of accident or if you feel unwell, seek medical advice immediately. When symptoms persist or in all cases of doubt seek medical advice.
If inhaled	:	If inhaled, remove to fresh air. Get medical attention.
In case of skin contact	:	In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
In case of eye contact	:	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lens, if worn. Get medical attention immediately.
If swallowed	:	If swallowed, DO NOT induce vomiting. Get medical attention. Rinse mouth thoroughly with water. Never give anything by mouth to an unconscious person.
Most important symptoms and effects, both acute and delayed	:	Harmful if swallowed. May cause an allergic skin reaction. Causes serious eye damage. Suspected of causing genetic defects. May cause cancer. May cause damage to organs through prolonged or repeated exposure.
Protection of first-aiders	:	First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists (see section 8).
Notes to physician	:	Treat symptomatically and supportively.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Water spray Alcohol-resistant foam Carbon dioxide (CO2) Dry chemical
Unsuitable extinguishing media	:	None known.
Specific hazards during fire-fighting	:	Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. Exposure to combustion products may be a hazard to health.
Hazardous combustion products	:	Carbon oxides Sulphur oxides Metal oxides
Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers. Remove undamaged containers from fire area if it is safe to do

so.
Evacuate area.

Special protective equipment for firefighters	:	In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.
Hazchem Code	:	2Z

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).
Environmental precautions	:	Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained.
Methods and materials for containment and cleaning up	:	Sweep up or vacuum up spillage and collect in suitable container for disposal. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable. Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

SECTION 7. HANDLING AND STORAGE

Technical measures	:	Static electricity may accumulate and ignite suspended dust causing an explosion. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres.
Local/Total ventilation	:	If sufficient ventilation is unavailable, use with local exhaust ventilation.
Advice on safe handling	:	Do not get on skin or clothing. Do not breathe dust. Do not swallow. Do not get in eyes. Wash skin thoroughly after handling. Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment Keep container tightly closed. Keep away from water. Protect from moisture. Minimize dust generation and accumulation. Keep container closed when not in use. Keep away from heat and sources of ignition.

		Take precautionary measures against static discharges. Do not eat, drink or smoke when using this product. Take care to prevent spills, waste and minimize release to the environment.
Hygiene measures	:	If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place. When using do not eat, drink or smoke. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before re-use. The effective operation of a facility should include review of engineering controls, proper personal protective equipment, appropriate degowning and decontamination procedures, industrial hygiene monitoring, medical surveillance and the use of administrative controls.
Conditions for safe storage	:	Keep in properly labelled containers. Store locked up. Keep tightly closed. Store in accordance with the particular national regulations.
Materials to avoid	:	Do not store with the following product types: Strong oxidizing agents

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
amitraz (ISO)	33089-61-1	TWA	20 µg/m3 (OEB 3)	Internal
		Wipe limit	200 µg/100 cm²	Internal
Calcium carbonate	471-34-1	TWA	10 mg/m3 (Calcium carbonate)	AU OEL

Occupational exposure limits of decomposition products

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Formaldehyde	50-00-0	STEL	2 ppm 2.5 mg/m3	AU OEL
	Further information: Category 2 (Carc. 2) Suspected human carcinogen, Sensitiser			
		TWA	1 ppm 1.2 mg/m3	AU OEL
	Further information: Category 2 (Carc. 2) Suspected human carcinogen, Sensitiser			
		TWA	0.1 ppm	ACGIH
		STEL	0.3 ppm	ACGIH

Engineering measures : All engineering controls should be implemented by facility design and operated in accordance with GMP principles to

protect products, workers, and the environment.
Containment technologies suitable for controlling compounds are required to control at source and to prevent migration of the compound to uncontrolled areas (e.g., open-face containment devices).
Minimize open handling.

Personal protective equipment

Respiratory protection	:	If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection.
Filter type	:	Combined particulates and inorganic gas/vapour type
Hand protection		
Material	:	Chemical-resistant gloves
Remarks	:	Consider double gloving.
Eye protection	:	Wear safety glasses with side shields or goggles. If the work environment or activity involves dusty conditions, mists or aerosols, wear the appropriate goggles. Wear a faceshield or other full face protection if there is a potential for direct contact to the face with dusts, mists, or aerosols.
Skin and body protection	:	Work uniform or laboratory coat. Additional body garments should be used based upon the task being performed (e.g., sleevelets, apron, gauntlets, disposable suits) to avoid exposed skin surfaces. Use appropriate degowning techniques to remove potentially contaminated clothing.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	powder
Colour	:	white grey
Odour	:	No data available
Odour Threshold	:	No data available
pH	:	No data available
Melting point/freezing point	:	No data available
Initial boiling point and boiling range	:	No data available
Flash point	:	Not applicable
Evaporation rate	:	Not applicable
Flammability (solid, gas)	:	May form explosive dust-air mixture during processing, handling or other means.

Flammability (liquids)	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapour pressure	:	Not applicable
Relative vapour density	:	Not applicable
Relative density	:	No data available
Density	:	No data available
Solubility(ies)		
Water solubility	:	No data available
Partition coefficient: n-octanol/water	:	Not applicable
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity		
Viscosity, kinematic	:	Not applicable
Explosive properties	:	Not explosive
Oxidizing properties	:	The substance or mixture is not classified as oxidizing.
Molecular weight	:	No data available
Particle size	:	No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Not classified as a reactivity hazard.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	May form explosive dust-air mixture during processing, handling or other means. Can react with strong oxidizing agents. Hazardous decomposition products will be formed upon contact with water or humid air.
Conditions to avoid	:	Exposure to moisture Heat, flames and sparks. Avoid dust formation.
Incompatible materials	:	Oxidizing agents Water

Hazardous decomposition products

Contact with water or humid air	:	Formaldehyde

SECTION 11. TOXICOLOGICAL INFORMATION

Exposure routes	:	Inhalation Skin contact Ingestion Eye contact

Acute toxicity

Harmful if swallowed.

Product:

Acute oral toxicity	:	Acute toxicity estimate: 946.17 mg/kg Method: Calculation method
Acute inhalation toxicity	:	Acute toxicity estimate: > 5 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: Calculation method

Components:

amitraz (ISO):

Acute oral toxicity	:	LD50 (Rat): > 400 mg/kg LD50 (Mouse): > 1,085 mg/kg LD50 (Guinea pig): > 400 mg/kg
Acute inhalation toxicity	:	Remarks: No data available
Acute dermal toxicity	:	LD50 (Rat): > 1,600 mg/kg

Calcium carbonate:

Acute oral toxicity	:	LD50 (Rat): > 2,000 mg/kg Method: OECD Test Guideline 420 Assessment: The substance or mixture has no acute oral toxicity
Acute inhalation toxicity	:	LC50 (Rat): > 3 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: OECD Test Guideline 403 Assessment: The substance or mixture has no acute inhalation toxicity
Acute dermal toxicity	:	LD50 (Rat): > 2,000 mg/kg Method: OECD Test Guideline 402 Assessment: The substance or mixture has no acute dermal toxicity

Nonylphenol, ethoxylated:

Acute oral toxicity : LD50 (Rat): 500 - 2,000 mg/kg

Paraformaldehyde:

Acute oral toxicity : LD50 (Rat, male): 592 mg/kg

Acute inhalation toxicity : LC50 (Rat): 1.07 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist

Acute dermal toxicity : LD50 (Rat): > 10,000 mg/kg

Skin corrosion/irritation

Not classified based on available information.

Components:

amitraz (ISO):

Species : Rabbit
Result : No skin irritation

Calcium carbonate:

Species : Rabbit
Method : OECD Test Guideline 404
Result : No skin irritation

Nonylphenol, ethoxylated:

Species : Rabbit
Method : OECD Test Guideline 404
Result : No skin irritation

Paraformaldehyde:

Species : Rabbit
Result : Skin irritation

Serious eye damage/eye irritation

Causes serious eye damage.

Components:

amitraz (ISO):

Species : Rabbit
Result : No eye irritation

Calcium carbonate:

Species : Rabbit
Result : No eye irritation
Method : OECD Test Guideline 405

Nonylphenol, ethoxylated:

Species	:	Rabbit
Result	:	Irreversible effects on the eye
Method	:	OECD Test Guideline 405

Paraformaldehyde:

Species	:	Rabbit
Result	:	Irreversible effects on the eye

Respiratory or skin sensitisation

Skin sensitisation

May cause an allergic skin reaction.

Respiratory sensitisation

Not classified based on available information.

Components:

amitraz (ISO):

Test Type	:	Maximisation Test
Exposure routes	:	Dermal
Species	:	Guinea pig
Result	:	Not a skin sensitizer.

Calcium carbonate:

Test Type	:	Local lymph node assay (LLNA)
Exposure routes	:	Skin contact
Species	:	Mouse
Method	:	OECD Test Guideline 429
Result	:	negative

Nonylphenol, ethoxylated:

Test Type	:	Maximisation Test
Exposure routes	:	Skin contact
Species	:	Guinea pig
Result	:	negative
Remarks	:	Based on data from similar materials

Paraformaldehyde:

Test Type	:	Local lymph node assay (LLNA)
Exposure routes	:	Skin contact
Species	:	Mouse
Result	:	positive
Remarks	:	Based on data from similar materials
Assessment	:	Probability or evidence of high skin sensitisation rate in humans

Chronic toxicity

Germ cell mutagenicity

Suspected of causing genetic defects.

Components:

amitraz (ISO):

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Test Type: In vitro mammalian cell gene mutation test
Result: negative

Test Type: Chromosome aberration test in vitro
Result: negative

Test Type: DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro)
Result: negative

Calcium carbonate:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative

Test Type: Chromosome aberration test in vitro
Method: OECD Test Guideline 473
Result: negative

Test Type: In vitro mammalian cell gene mutation test
Method: OECD Test Guideline 476
Result: negative

Nonylphenol, ethoxylated:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: negative
Remarks: Based on data from similar materials

Paraformaldehyde:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: positive
Remarks: Based on data from similar materials

Test Type: In vitro mammalian cell gene mutation test
Result: positive
Remarks: Based on data from similar materials

Test Type: in vitro micronucleus test
Result: positive
Remarks: Based on data from similar materials

Test Type: DNA damage and repair, unscheduled DNA syn-

thesis in mammalian cells (in vitro)
Result: positive
Remarks: Based on data from similar materials

Test Type: In vitro sister chromatid exchange assay in mammalian cells
Result: positive
Remarks: Based on data from similar materials

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Rat
Application Route: inhalation (vapour)
Result: positive
Remarks: Based on data from similar materials

Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Rat
Application Route: Ingestion
Result: positive
Remarks: Based on data from similar materials

Germ cell mutagenicity - Assessment : Positive result(s) from in vivo mammalian somatic cell mutagenicity tests.

Carcinogenicity

May cause cancer.

Components:

amitraz (ISO):

Species	:	Rat
Application Route	:	Oral
Exposure time	:	2 Years
NOAEL	:	> 10.18 mg/kg body weight
Result	:	negative

Species	:	Mouse
Exposure time	:	2 Years
LOAEL	:	2.3 mg/kg body weight
Result	:	positive
Target Organs	:	Liver, Stomach

Paraformaldehyde:

Species	:	Rat
Application Route	:	Ingestion
Exposure time	:	105 weeks
Result	:	negative

Species	:	Rat
Application Route	:	Inhalation
Exposure time	:	28 Months
Result	:	positive

Remarks : Based on data from similar materials

Carcinogenicity - Assessment : Sufficient evidence of carcinogenicity in animal experiments

Reproductive toxicity
Not classified based on available information.

Components:

amitraz (ISO):

Effects on fertility : Test Type: Three-generation reproduction toxicity study
Species: Rat
Application Route: Oral
Fertility: NOAEL: > 4.8 mg/kg body weight
Result: No significant adverse effects were reported

Effects on foetal development : Test Type: Embryo-foetal development
Species: Rat
Application Route: Oral
Developmental Toxicity: NOAEL: 3 mg/kg body weight
Remarks: No significant adverse effects were reported

Test Type: Embryo-foetal development
Species: Rabbit
Application Route: Oral
Developmental Toxicity: NOAEL: 5 mg/kg body weight
Result: Effects on foetal development

Calcium carbonate:

Effects on fertility : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 422
Result: negative

Effects on foetal development : Test Type: Embryo-foetal development
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 414
Result: negative

STOT - single exposure
Not classified based on available information.

Components:

Paraformaldehyde:

Assessment : May cause respiratory irritation.

STOT - repeated exposure
May cause damage to organs (Liver, Central nervous system) through prolonged or repeated exposure.

Components:

amitraz (ISO):

Target Organs	:	Liver, Central nervous system
Assessment	:	May cause damage to organs through prolonged or repeated exposure.

Repeated dose toxicity

Components:

amitraz (ISO):

Species	:	Mouse
NOAEL	:	3 mg/kg
Application Route	:	Oral
Exposure time	:	90 Days
Target Organs	:	Liver

Species	:	Dog
NOAEL	:	0.25 mg/kg
Application Route	:	Oral
Exposure time	:	90 Days
Target Organs	:	Central nervous system, Liver

Calcium carbonate:

Species	:	Rat
NOAEL	:	> 1,000 mg/kg
Application Route	:	Ingestion
Exposure time	:	28 Days
Method	:	OECD Test Guideline 422

Paraformaldehyde:

Species	:	Rat, male
NOAEL	:	15 mg/kg
Application Route	:	Ingestion
Exposure time	:	105 Weeks
Remarks	:	Based on data from similar materials

Aspiration toxicity

Not classified based on available information.

Experience with human exposure

Components:

amitraz (ISO):

Ingestion	:	Target Organs: Central nervous system

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

amitraz (ISO):

Toxicity to fish	:	LC50 (Lepomis macrochirus (Bluegill sunfish)): 0.45 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 0.035 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	NOEC (Pseudokirchneriella subcapitata (green algae)): 0.04 mg/l Exposure time: 91 h
Toxicity to fish (Chronic toxicity)	:	NOEC (Pimephales promelas (fathead minnow)): 0.00148 mg/l Exposure time: 32 d
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 0.0011 mg/l Exposure time: 21 d

Calcium carbonate:

Toxicity to fish	:	LL50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l Exposure time: 96 h Test substance: Water Accommodated Fraction Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EL50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 48 h Test substance: Water Accommodated Fraction Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	NOELR (Pseudokirchneriella subcapitata (green algae)): 50 mg/l Exposure time: 72 h Test substance: Water Accommodated Fraction Method: OECD Test Guideline 201 EL50 (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l Exposure time: 72 h Test substance: Water Accommodated Fraction Method: OECD Test Guideline 201
Toxicity to microorganisms	:	NOEC: 1,000 mg/l Exposure time: 3 h Method: OECD Test Guideline 209 EC50: > 1,000 mg/l Exposure time: 3 h Method: OECD Test Guideline 209

Nonylphenol, ethoxylated:

Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia sp. (water flea)): 1.82 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	EC50 (Pseudokirchneriella subcapitata (green algae)): 20 mg/l Exposure time: 48 h

Paraformaldehyde:

Toxicity to fish	:	LC50: > 1 mg/l Exposure time: 96 h Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia pulex (Water flea)): > 1 mg/l Exposure time: 48 h Method: OECD Test Guideline 202 Remarks: Based on data from similar materials
Toxicity to algae/aquatic plants	:	ErC50 (Desmodesmus subspicatus (green algae)): > 1 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 Remarks: Based on data from similar materials
Toxicity to fish (Chronic toxicity)	:	NOEC (Oryzias latipes (Orange-red killifish)): > 1 mg/l Exposure time: 28 d Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): > 1 mg/l Exposure time: 21 d Method: OECD Test Guideline 211 Remarks: Based on data from similar materials
Toxicity to microorganisms	:	EC50: > 10 mg/l Exposure time: 3 h Method: OECD Test Guideline 209 Remarks: Based on data from similar materials

Persistence and degradability

Components:

Nonylphenol, ethoxylated:

Biodegradability	:	Result: Readily biodegradable. Biodegradation: 97 % Exposure time: 30 d

Paraformaldehyde:

Biodegradability	:	Result: Readily biodegradable. Remarks: Based on data from similar materials

Bioaccumulative potential

Components:

amitraz (ISO):

Bioaccumulation	:	Species: Lepomis macrochirus (Bluegill sunfish) Bioconcentration factor (BCF): 1,333
Partition coefficient: n-octanol/water	:	log Pow: 5.5

Nonylphenol, ethoxylated:

Partition coefficient: n-octanol/water	:	log Pow: 4.48

Paraformaldehyde:

Partition coefficient: n-octanol/water	:	log Pow: -1.40 Remarks: Calculation

Mobility in soil

Components:

amitraz (ISO):

Distribution among environmental compartments	:	log Koc: 3.3

Other adverse effects

Components:

Nonylphenol, ethoxylated:

Results of PBT and vPvB assessment	:	This substance is considered to be persistent, bioaccumulating and toxic (PBT). This substance is considered to be very persistent and very bioaccumulating (vPvB).

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Dispose of in accordance with local regulations.
Contaminated packaging	:	Empty containers should be taken to an approved waste handling site for recycling or disposal. If not otherwise specified: Dispose of as unused product.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG

UN number	:	UN 3077
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (amitraz (ISO), Nonylphenol, ethoxylated)
Class	:	9

Packing group	:	III
Labels	:	9

IATA-DGR

UN/ID No.	:	UN 3077
Proper shipping name	:	Environmentally hazardous substance, solid, n.o.s. (amitraz (ISO), Nonylphenol, ethoxylated)
Class	:	9
Packing group	:	III
Labels	:	Miscellaneous
Packing instruction (cargo aircraft)	:	956
Packing instruction (passenger aircraft)	:	956
Environmentally hazardous	:	yes

IMDG-Code

UN number	:	UN 3077
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (amitraz (ISO), Nonylphenol, ethoxylated)
Class	:	9
Packing group	:	III
Labels	:	9
EmS Code	:	F-A, S-F
Marine pollutant	:	yes

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

National Regulations

ADG

UN number	:	UN 3077
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (amitraz (ISO), Nonylphenol, ethoxylated)
Class	:	9
Packing group	:	III
Labels	:	9
Hazchem Code	:	2Z

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

Prohibition/Licensing Requirements	:	There is no applicable prohibition, authorisation and restricted use requirements, including for carcinogens referred to in Schedule 10 of

the model WHS Act and Regulations.

The components of this product are reported in the following inventories:

AICS	:	not determined
DSL	:	not determined
IECSC	:	not determined

SECTION 16. OTHER INFORMATION

Further information

Revision Date	:	09.04.2022
Sources of key data used to compile the Safety Data Sheet	:	Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, http://echa.europa.eu/
Date format	:	dd.mm.yyyy

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
AU OEL	:	Australia. Workplace Exposure Standards for Airborne Contaminants.
ACGIH / TWA	:	8-hour, time-weighted average
ACGIH / STEL	:	Short-term exposure limit
AU OEL / TWA	:	Exposure standard - time weighted average
AU OEL / STEL	:	Exposure standard - short term exposure limit

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No

1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

AU / EN

Section 1 - Identification of The Material and Supplier

The Hunter River Company Pty Ltd **Phone: 03 5820 8400 (office hours)**
74-76 Drummond Road
Shepparton VIC 3630 AUSTRALIA

Chemical nature: Amitraz is an amidine derivative.
Trade Name: **Exitraz WP Cattle Dip and Spray**
APVMA Code: 64458
Product Use: Animal insecticide for use as described on the product label.
Creation Date: **August, 2016**
This version issued: **August, 2022** and is valid for 5 years from this date.
Poisons Information Centre: Phone 13 1126 from anywhere in Australia

Section 2 - Hazards Identification

Statement of Hazardous Nature
SUSMP Classification: S6
ADG Classification: Class 9: Miscellaneous Dangerous Goods.
UN Number: 3077, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.

GHS Signal word: WARNING

Acute Toxicity Oral Category 4
Skin Sensitisation Category 1
Specific Target Organ toxicity - repeated exposure Category 2
Hazardous to aquatic environment Short term/Chronic Category 1

HAZARD STATEMENT:
H302: Harmful if swallowed.
H317: May cause an allergic skin reaction.
H373: May cause damage to organs through prolonged or repeated exposure.
H410: Very toxic to aquatic life with long lasting effects.

PREVENTION
P102: Keep out of reach of children.
P261: Avoid breathing fumes, mists, vapours or spray.
P262: Do not get in eyes, on skin, or on clothing.
P264: Wash contacted areas thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P272: Contaminated work clothing should not be allowed out of the workplace.
P273: Avoid release to the environment.
P280: Wear protective gloves, protective clothing and eye or face protection.

RESPONSE
P314: Get medical advice or attention if you feel unwell.
P363: Wash contaminated clothing before reuse.
P301+P312: IF SWALLOWED: Call a POISON CENTRE or doctor if you feel unwell.
P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P302+P352: IF ON SKIN: Wash with plenty of soap and water.
P333+P313: If skin irritation or rash occurs: Get medical advice.
P391: Collect spillage.
P370+P378: Not combustible. Use extinguishing media suited to burning materials.

STORAGE
P410: Protect from sunlight.
P402+P404: Store in a dry place. Store in a closed container.
P403+P235: Store in a well-ventilated place. Keep cool.

DISPOSAL
P501: Dispose of contents and containers as specified on the registered label.

Emergency Overview

Physical Description & Colour: White to greyish powder.
Odour: No data re odour.
Major Health Hazards: Signs of acute Amitraz poisoning in male and female rats treated with 440 mg/kg and 365 mg/kg respectively, include coolness to touch, reduced spontaneous activity, episodes of increased induced activity such as aggression in response to handling, and signs of general debilitation. harmful if swallowed, possible skin sensitiser.

Section 3 - Composition/Information on Ingredients

Ingredients	CAS No	Conc,%	TWA (mg/m^3)	STEL (mg/m^3)
Amitraz	33089-61-1	500g/kg	not set	not set
Other non hazardous ingredients	secret	to 100	not set	not set

This is a commercial product whose exact ratio of components may vary slightly. Minor quantities of other non hazardous ingredients are also possible.

The SWA TWA exposure value is the average airborne concentration of a particular substance when calculated over a normal 8 hour working day for a 5 day working week. The STEL (Short Term Exposure Limit) is an exposure value that may be equalled (but should not be exceeded) for no longer than 15 minutes and should not be repeated more than 4 times per day. There should be at least 60 minutes between successive exposures at the STEL. The term "peak "is used when the TWA limit, because of the rapid action of the substance, should never be exceeded, even briefly.

Section 4 - First Aid Measures

General Information:

You should call The Poisons Information Centre if you feel that you may have been poisoned, burned or irritated by this product. The number is 13 1126 from anywhere in Australia (0800 764 766 in New Zealand) and is available at all times. Have this SDS with you when you call.

Inhalation: No first aid measures normally required. However, if inhalation has occurred, and irritation has developed, remove to fresh air and observe until recovered. If irritation becomes painful or persists more than about 30 minutes, seek medical advice.
Skin Contact: Gently brush away excess particles. Irritation is unlikely. However, if irritation does occur, flush with lukewarm, gently flowing water for 5 minutes or until chemical is removed.
Eye Contact: Quickly and gently brush particles from eyes. No effects expected. If irritation does occur, flush contaminated eye(s) with lukewarm, gently flowing water for 5 minutes or until the product is removed. Obtain medical advice if irritation becomes painful or lasts more than a few minutes. Take special care if exposed person is wearing contact lenses.
Ingestion: If swallowed, do NOT induce vomiting. Wash mouth with water and contact a Poisons Information Centre, or call a doctor.

Section 5 - Fire Fighting Measures

Fire and Explosion Hazards: The major hazard in fires is usually inhalation of heated and toxic or oxygen deficient (or both), fire gases. There is no risk of an explosion from this product under normal circumstances if it is involved in a fire.
Fire decomposition products from this product may be toxic if inhaled. Take appropriate protective measures.
Extinguishing Media: In case of fire, use carbon dioxide, dry chemical, foam, water fog.
Fire Fighting: If a significant quantity of this product is involved in a fire, call the fire brigade.
Flammability Class: No data.

Section 6 - Accidental Release Measures

Accidental release: In the event of a major spill, prevent spillage from entering drains or water courses. Wear full protective clothing including eye/face protection. All skin areas should be covered. See below under Personal Protection regarding Australian Standards relating to personal protective equipment. Suitable materials for protective clothing include rubber. Eye/face protective equipment should comprise as a minimum, protective goggles. If there is a significant chance that dusts are likely to build up in cleanup area, we recommend that you use a suitable dust mask. Use a P1 mask, designed for use against mechanically generated particles e.g. silica & asbestos. Otherwise, not normally necessary.
Stop leak if safe to do so, and contain spill. Sweep up and shovel or collect recoverable product into labelled containers for recycling or salvage, and dispose of promptly. Consider vacuuming if appropriate. Recycle containers wherever possible after careful cleaning. Refer to product label for specific instructions. After spills, wash area preventing runoff from entering drains. If a significant quantity of material enters drains, advise emergency services. Full details regarding disposal of used containers, spillage and unused material may be found on the label. If there is

any conflict between this SDS and the label, instructions on the label prevail. Ensure legality of disposal by consulting regulations prior to disposal. Thoroughly launder protective clothing before storage or re-use. Advise laundry of nature of contamination when sending contaminated clothing to laundry.

Section 7 - Handling and Storage

Handling: Keep exposure to this product to a minimum, and minimise the quantities kept in work areas. Check Section 8 of this SDS for details of personal protective measures, and make sure that those measures are followed. The measures detailed below under "Storage" should be followed during handling in order to minimise risks to persons using the product in the workplace. Also, avoid contact or contamination of product with incompatible materials listed in Section 10.

Storage: This product is a Scheduled Poison. Observe all relevant regulations regarding sale, transport and storage of this schedule of poison. Protect this product from light. Store in the closed original container in a dry, cool, well-ventilated area out of direct sunlight. Make sure that the product does not come into contact with substances listed under "Incompatibilities" in Section 10. Check packaging - there may be further storage instructions on the label.

Section 8 - Exposure Controls and Personal Protection

The following Australian Standards will provide general advice regarding safety clothing and equipment:

Respiratory equipment: **AS/NZS 1715**, Protective Gloves: **AS 2161**, Occupational Protective Clothing: AS/NZS 4501 set 2008, Industrial Eye Protection: **AS1336** and **AS/NZS 1337**, Occupational Protective Footwear: **AS/NZS2210**.

SWA Exposure Limits **TWA (mg/m^3)** **STEL (mg/m^3)**

Exposure limits have not been established by SWA for this product.

The ADI for Amitraz is set at 0.002mg/kg/day. The corresponding NOEL is set at 0.25mg/kg/day. ADI means Acceptable Daily Intake; NOEL means No-observable-effect-level. Data from Australian ADI List, June 2014.

No special equipment is usually needed when occasionally handling small quantities. The following instructions are for bulk handling or where regular exposure in an occupational setting occurs without proper containment systems.

Ventilation: This product should only be used in a well ventilated area. If natural ventilation is inadequate, use of a fan is suggested.

Eye Protection: Eye protection such as protective glasses or goggles is recommended when this product is being used.

Skin Protection: If you believe you may have a sensitisation to this product or any of its declared ingredients, you should prevent skin contact by wearing impervious gloves, clothes and, preferably, apron. Make sure that all skin areas are covered. See below for suitable material types.

Protective Material Types: We suggest that protective clothing be made from the following materials: rubber.

Respirator: If there is a significant chance that dusts are likely to build up in the area where this product is being used, we recommend that you use a suitable dust mask. Otherwise, not normally necessary.

Section 9 - Physical and Chemical Properties:

Physical Description & colour:	White to greyish powder.
Odour:	No data re odour.
Boiling Point:	Not available.
Flash point:	Does not burn.
Upper Flammability Limit:	No data.
Lower Flammability Limit:	No data.
Autoignition temperature:	No data.
Freezing/Melting Point:	No specific data. Solid at normal temperatures.
Volatiles:	No specific data. Expected to be low at 100°C.
Vapour Pressure:	Negligible at normal ambient temperatures.
Vapour Density:	Not applicable.
Specific Gravity:	1.02-1.05 at 20°C
Water Solubility:	Dispersible.
pH:	No data.
Volatility:	Negligible at normal ambient temperatures.
Odour Threshold:	No data.
Evaporation Rate:	Not applicable.
Coeff Oil/water Distribution:	No data
Particle Characteristics:	Powder.
Autoignition temp:	No data.

Section 10 - Stability and Reactivity

Reactivity: This product is unlikely to react or decompose under normal storage conditions. However, if you have any doubts, contact the supplier for advice on shelf life properties.
Conditions to Avoid: Protect this product from light. Store in the closed original container in a dry, cool, well-ventilated area out of direct sunlight.
Incompatibilities: strong acids, strong bases, strong oxidising agents.
Fire Decomposition: Combustion forms carbon dioxide, and if incomplete, carbon monoxide and possibly smoke. Water is also formed. May form nitrogen and its compounds, and under some circumstances, oxides of nitrogen. Occasionally hydrogen cyanide gas in reducing atmospheres. Carbon monoxide poisoning produces headache, weakness, nausea, dizziness, confusion, dimness of vision, disturbance of judgment, and unconsciousness followed by coma and death.
Polymerisation: This product will not undergo polymerisation reactions.

Section 11 - Toxicological Information

Toxicity: Acute Toxicity: Amitraz is harmful to mammals if ingested orally. The oral LD50 is 523-800 mg/kg for Amitraz in rats. The oral LD50 is greater than 1,600 mg/kg for mice. Dermal exposure results in an LD50 of greater than 1,600 mg/kg for rats and greater than 200 mg/kg for rabbits. The inhalation LC50 (6 hours) of Amitraz for rats is 65 mg/l of air. Amitraz is not a skin irritant and does not sensitize skin. Signs of acute Amitraz poisoning in male and female rats treated with 440 mg/kg and 365 mg/kg respectively, include coolness to touch, reduced spontaneous activity, episodes of increased induced activity such as aggression in response to handling, and signs of general debilitation. Amitraz also may produce a slowly reversible emaciation in survivors.
Chronic Toxicity: In two-year feeding trials, rats who received 50 mg/kg/day in their diet and dogs who received 0.25 mg/kg/day of Amitraz did not show any ill-effects.
Reproductive Effects: Doses of 200 mg/kg/day of Amitraz for ten weeks decreased fertility in male and female rats. Female mice treated orally for 5 days with 50 mg/kg/day of Amitraz and then mated showed a slight increase in loss of foetuses and a decrease in the number of living offspring. When male mice were given 50 mg/kg/day of Amitraz orally for 5 days and then mated, the resulting embryos were significantly less likely to grow in the mother's uterus. Female mice who received 400 mg/kg/day of Amitraz in their diet for up to 33 weeks, showed a significant increase in the time they were sexually receptive. The highest dose of Amitraz which has no observable effect on the death of unborn rats (foetotoxic NOEL) is 3 mg/kg/day. The highest dose of Amitraz that does not cause an observable effect in the death of rat embryos (Embryotoxic NOEL) is 5 mg/kg/day. Rats who received 12 mg/kg/day of Amitraz from day one of pregnancy until the young were weaned at 21 days old had a reduced number of young born and alive at day four. Rabbits who received 25 mg/kg/day of Amitraz from days 6 to 18 of pregnancy had fewer and smaller litters. Although there have been reproductive effects observed in laboratory animals at some dose levels, likely human exposures are very much less than those which produced effects. These effects are unlikely in humans under normal circumstances.
Teratogenic Effects: In one study, rats treated with 12 mg/kg/day of Amitraz from days 8 to 20 of pregnancy, the offspring were heavier but had less bone development than the offspring of untreated rats. However, an EPA study indicates that the highest dose at which Amitraz has no observable effect on test rats' offspring (teratogenic NOEL) is 12 mg/kg/day. The teratogenic NOEL of rabbits is 25 mg/kg/day. These studies indicate that high doses of Amitraz exposure during pregnancy produced adverse effects in laboratory animals. Likely human exposures are very much less than those which produced effects, and these effects are unlikely in humans under normal circumstances.
Mutagenic Effects: A variety of tests indicate that Amitraz is not mutagenic and does not cause damage to DNA.
Carcinogenic Effects: Long term feeding studies show that Amitraz is not carcinogenic in rats. However, it can cause tumours in female mice. Amitraz causes an increase in tumours of the lungs and lymph nodes in female mice, but not males, at 57 mg/kg/day over 20 months. A two-year study of female mice also showed an increase in tumours of the liver (hepatocellular tumours) at 57 mg/kg/day of Amitraz). Because Amitraz causes cancer in female mice, but not male mice or male or female rats, it is unclassifiable as to human carcinogenicity.
Organ Toxicity: At high doses, Amitraz can reduce the function of the hypothalamus, which helps regulate the metabolism by controlling hormone release in the body. A daily dose of 200 mg of Amitraz per kilogram of body weight for ten weeks causes decreased growth and food consumption.
Fate in Humans and Animals: Available data suggest that Amitraz, following absorption into the blood, is not readily absorbed into tissues, and is mostly excreted unchanged via the urine).
There is no data to hand indicating any particular target organs.

Amitraz is classed by SWA as a potential sensitiser by skin contact.

Classification of Hazardous Ingredients

Ingredient	Health Hazard Statement Codes
Amitraz	H302, H373, H317, H410

- Acute toxicity - category 4
- Specific target organ toxicity (repeated exposure) - category 2
- Skin sensitisation - category 1
- Hazardous to the aquatic environment (acute) - category 1
- Hazardous to the aquatic environment (chronic) - category 1

Potential Health Effects

Persons sensitised to Amitraz should avoid contact with this product.

Inhalation:
Short Term Exposure: Available data indicates that this product is not harmful. However product may be mildly irritating, although unlikely to cause anything more than mild transient discomfort.
Long Term Exposure: No data for health effects associated with long term inhalation.

Skin Contact:
Short Term Exposure: Classified as a potential sensitiser by skin contact. Exposure to a skin sensitiser, once sensitisation has occurred, may manifest itself as skin rash or inflammation, and in some individuals this reaction can be severe. However product is unlikely to cause any discomfort in normal use.
Long Term Exposure: No data for health effects associated with long term skin exposure.

Eye Contact:
Short Term Exposure: This product may be irritating to eyes, but is unlikely to cause anything more than mild transient discomfort.
Long Term Exposure: No data for health effects associated with long term eye exposure.

Ingestion:
Short Term Exposure: Significant oral exposure is considered to be unlikely. Available data shows that this product is harmful, but symptoms are not available. However, this product may be irritating to mucous membranes but is unlikely to cause anything more than transient discomfort.
Long Term Exposure: No data for health effects associated with long term ingestion.

Carcinogen Status:
SWA: No significant ingredient is classified as carcinogenic by SWA.
NTP: No significant ingredient is classified as carcinogenic by NTP.
IARC: No significant ingredient is classified as carcinogenic by IARC.

Section 12 - Ecological Information

Very toxic to aquatic organisms, may cause long-term adverse effects to the aquatic environment. This product is biodegradable. It will not accumulate in the soil or water or cause long term problems.
Effects on Birds: Amitraz is not toxic to birds. The dietary LC_{50} (8 day) is 7,000 mg/kg for mallard ducks and 1,800 mg/kg for Japanese quail. The oral LD_{50} for bobwhite quail is 788 mg/kg. Amitraz may affect reproduction in birds. The avian reproduction NOEL is less than 40 ppm.
Effects on Aquatic Organisms: Amitraz is moderately toxic to fish. The LC_{50} (96-hour exposure) is 1.3 mg/l for bluegill sunfish and 3.2-4.2 mg/l for harlequin fish. For a 48-hour exposure of rainbow trout, a cold water species, the LC_{50} is 2.7-4.0 mg/l. Daphnia, a fresh water invertebrate, exhibited toxic effects at 35 ppb of Amitraz in water.
Effects on Other Animals (Nontarget species): Amitraz is relatively non-toxic to bees. The LD_{50} is 12 µg per bee by ingestion and 3.6 mg/l by direct spraying.
ENVIRONMENTAL FATE
Breakdown of Chemical in Soil: Amitraz is broken down rapidly in soil containing oxygen. The half-life in soil, the amount of time needed for the chemical to degrade to half its original concentration, is less than one day. Degradation occurs more rapidly in acidic soils than in alkaline or neutral soils.
Breakdown of Chemical in Vegetation: Reports indicate that Amitraz may cause crop injury to young peppers and pears during high temperature conditions.

Section 13 - Disposal Considerations

Disposal: Special help is available for the disposal of Agricultural Chemicals. The product label will give general advice regarding disposal of small quantities, and how to cleanse containers. However, for help with the collection of unwanted rural chemicals, contact ChemClear 1800 008 182 http://www.chemclear.com.au/ and for help with the disposal of empty drums, contact DrumMuster http://www.drummuster.com.au/ where you will find contact details for your area.

Section 14 - Transport Information

Not subject to the ADG Code when transported by Road or Rail in Australia, in packages 500kg(L) or less; or IBCs, but classed as Dangerous by IATA and IMDG/IMSBC when carried by Air or Sea transport (see details below).

UN Number: 3077, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
Hazchem Code: 2Z
Special Provisions: 274, 331, 335, 375, AU01
Limited quantities: ADG 7 specifies a Limited Quantity value of 5 kg for this class of product.
Dangerous Goods Class: Class 9: Miscellaneous Dangerous Goods.
Packing Group: III
Packing Instruction: P002, IBC08, LP02

Class 9 Miscellaneous Dangerous Goods shall not be loaded in the same vehicle or packed in the same freight container with Dangerous Goods of Class 1 (Explosives).

Section 15 - Regulatory Information

AIIC: This product is compliant with AICIS regulations.
The following ingredient: Amitraz, is mentioned in the SUSMP.

Section 16 - Other Information

This SDS contains only safety-related information. For other data see product literature.

Acronyms:

ADG Code	Australian Code for the Transport of Dangerous Goods by Road and Rail (7th edition)
AIIC	Australian Inventory of Industrial Chemicals
SWA	Safe Work Australia, formerly ASCC and NOHSC
CAS number	Chemical Abstracts Service Registry Number
Hazchem Code	Emergency action code of numbers and letters that provide information to emergency services especially firefighters
IARC	International Agency for Research on Cancer
NOS	Not otherwise specified
NTP	National Toxicology Program (USA)
SUSMP	Standard for the Uniform Scheduling of Medicines & Poisons
UN Number	United Nations Number

THIS SDS SUMMARISES OUR BEST KNOWLEDGE OF THE HEALTH AND SAFETY HAZARD INFORMATION OF THE PRODUCT AND HOW TO SAFELY HANDLE AND USE THE PRODUCT IN THE WORKPLACE. EACH USER MUST REVIEW THIS SDS IN THE CONTEXT OF HOW THE PRODUCT WILL BE HANDLED AND USED IN THE WORKPLACE.

IF CLARIFICATION OR FURTHER INFORMATION IS NEEDED TO ENSURE THAT AN APPROPRIATE RISK ASSESSMENT CAN BE MADE, THE USER SHOULD CONTACT THIS COMPANY SO WE CAN ATTEMPT TO OBTAIN ADDITIONAL INFORMATION FROM OUR SUPPLIERS

OUR RESPONSIBILITY FOR PRODUCTS SOLD IS SUBJECT TO OUR STANDARD TERMS AND CONDITIONS, A COPY OF WHICH IS SENT TO OUR CUSTOMERS AND IS ALSO AVAILABLE ON REQUEST.

Please read all labels carefully before using product.

This SDS is prepared in accord with the SWA document “Preparation of Safety Data Sheets for Hazardous Chemicals - Code of Practice” (July 2020) and GHS Revision 7

http://www.kilford.com.au/ Phone (02)8321 8866

SAFETY DATA SHEET
according to the OSHA Hazard Communication Standard

Amitraz (12.5%) Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 04/04/2023
7.1	09/30/2023	1829157-00016	Date of first issue: 07/11/2017

SECTION 1. IDENTIFICATION

Product name : Amitraz (12.5%) Formulation

Manufacturer or supplier's details

Company name of supplier : Merck & Co., Inc
Address : 126 E. Lincoln Avenue
Rahway, New Jersey U.S.A. 07065
Telephone : 908-740-4000
Emergency telephone : 1-908-423-6000
E-mail address : EHSDATASTEWARD@merck.com

Recommended use of the chemical and restrictions on use

Recommended use : Veterinary product
Restrictions on use : Not applicable

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity (Oral) : Category 4

Eye irritation : Category 2A

Reproductive toxicity : Category 1B

Specific target organ toxicity - single exposure : Category 3

Specific target organ toxicity - repeated exposure : Category 1 (Kidney, Heart, Gastrointestinal tract, Lymph nodes)

Specific target organ toxicity - repeated exposure : Category 2 (Liver, Central nervous system)

Aspiration hazard : Category 1

GHS label elements

Hazard pictograms :

Signal Word : Danger

Hazard Statements : H302 Harmful if swallowed.
H304 May be fatal if swallowed and enters airways.
H319 Causes serious eye irritation.
H336 May cause drowsiness or dizziness.
H360F May damage fertility.
H372 Causes damage to organs (Kidney, Heart, Gastrointesti-

nal tract, Lymph nodes) through prolonged or repeated exposure.
H373 May cause damage to organs (Liver, Central nervous system) through prolonged or repeated exposure.

Precautionary Statements :

Prevention:

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe mist or vapors.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves, protective clothing, eye protection and face protection.

Response:

P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a doctor if you feel unwell.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical attention.
P331 Do NOT induce vomiting.
P337 + P313 If eye irritation persists: Get medical attention.

Storage:

P405 Store locked up.

Disposal:

P501 Dispose of contents and container to an approved waste disposal plant.

Other hazards

Repeated exposure may cause skin dryness or cracking.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	CAS-No.	Concentration (% w/w)
Hydrocarbons, C10, aromatics, <1% naphthalene	64742-94-5	>= 50 - < 70
4-Nonylphenol, branched, ethoxylated	127087-87-0	>= 10 - < 20
Amitraz (ISO)	33089-61-1	>= 10 - < 20
Bis(2,6-diisopropylphenyl)carbodiimide	2162-74-5	>= 1 - < 5

Actual concentration is withheld as a trade secret

Alternative CAS Numbers for some regions

Chemical name	Alternative CAS Number(s)
4-Nonylphenol, branched, ethoxylated	68412-54-4

SECTION 4. FIRST AID MEASURES

General advice	:	In the case of accident or if you feel unwell, seek medical advice immediately. When symptoms persist or in all cases of doubt seek medical advice.
If inhaled	:	If inhaled, remove to fresh air. Get medical attention.
In case of skin contact	:	In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
In case of eye contact	:	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lens, if worn. Get medical attention.
If swallowed	:	If swallowed, DO NOT induce vomiting. If vomiting occurs have person lean forward. Call a physician or poison control center immediately. Rinse mouth thoroughly with water. Never give anything by mouth to an unconscious person.
Most important symptoms and effects, both acute and delayed	:	Harmful if swallowed. May be fatal if swallowed and enters airways. Causes serious eye irritation. May cause drowsiness or dizziness. May damage fertility. Causes damage to organs through prolonged or repeated exposure. Prolonged or repeated contact may dry skin and cause irritation.
Protection of first-aiders	:	First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists (see section 8).
Notes to physician	:	Treat symptomatically and supportively.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Water spray Alcohol-resistant foam Carbon dioxide (CO2) Dry chemical
Unsuitable extinguishing media	:	None known.
Specific hazards during fire fighting	:	Exposure to combustion products may be a hazard to health.
Hazardous combustion products	:	Carbon oxides Nitrogen oxides (NOx)

Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers. Remove undamaged containers from fire area if it is safe to do so. Evacuate area.
Special protective equipment for fire-fighters	:	In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).
Environmental precautions	:	Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Prevent spreading over a wide area (e.g., by containment or oil barriers). Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained.
Methods and materials for containment and cleaning up	:	Soak up with inert absorbent material. For large spills, provide diking or other appropriate containment to keep material from spreading. If diked material can be pumped, store recovered material in appropriate container. Clean up remaining materials from spill with suitable absorbent. Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable. Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

SECTION 7. HANDLING AND STORAGE

Technical measures	:	See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
Local/Total ventilation	:	If sufficient ventilation is unavailable, use with local exhaust ventilation.
Advice on safe handling	:	Do not get on skin or clothing. Do not breathe mist or vapors. Do not swallow. Do not get in eyes. Wash skin thoroughly after handling. Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment Keep container tightly closed.

Do not eat, drink or smoke when using this product.
Take care to prevent spills, waste and minimize release to the environment.

Conditions for safe storage : Keep in properly labeled containers.
Store locked up.
Keep tightly closed.
Keep in a cool, well-ventilated place.
Store in accordance with the particular national regulations.

Materials to avoid : Do not store with the following product types:
Strong oxidizing agents
Self-reactive substances and mixtures
Organic peroxides
Explosives
Gases

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Hydrocarbons, C10, aromatics, <1% naphthalene	64742-94-5	TWA (Inhalable particulate matter)	5 mg/m³	ACGIH
		TWA (Mist)	5 mg/m³	NIOSH REL
		ST (Mist)	10 mg/m³	NIOSH REL
		TWA	500 ppm 2,000 mg/m³	OSHA Z-1
Amitraz (ISO)	33089-61-1	TWA	10 µg/m3 (OEB 3)	Internal
		Wipe limit	1250 µg/100 cm²	Internal

Engineering measures : Use appropriate engineering controls and manufacturing technologies to control airborne concentrations (e.g., dripless quick connections).
All engineering controls should be implemented by facility design and operated in accordance with GMP principles to protect products, workers, and the environment.
Containment technologies suitable for controlling compounds are required to control at source and to prevent migration of the compound to uncontrolled areas (e.g., open-face containment devices).
Minimize open handling.

Personal protective equipment

Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air

supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

Hand protection
Material : Chemical-resistant gloves

Remarks : Consider double gloving.

Eye protection : Wear safety glasses with side shields or goggles.
If the work environment or activity involves dusty conditions, mists or aerosols, wear the appropriate goggles.
Wear a faceshield or other full face protection if there is a potential for direct contact to the face with dusts, mists, or aerosols.

Skin and body protection : Work uniform or laboratory coat.
Additional body garments should be used based upon the task being performed (e.g., sleevelets, apron, gauntlets, disposable suits) to avoid exposed skin surfaces.
Use appropriate degowning techniques to remove potentially contaminated clothing.

Hygiene measures : If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place.
When using do not eat, drink or smoke.
Wash contaminated clothing before re-use.
The effective operation of a facility should include review of engineering controls, proper personal protective equipment, appropriate degowning and decontamination procedures, industrial hygiene monitoring, medical surveillance and the use of administrative controls.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Color	:	yellow
Odor	:	characteristic, aromatic, hydrocarbon-like
Odor Threshold	:	No data available
pH	:	No data available
Melting point/freezing point	:	Not applicable
Initial boiling point and boiling range	:	No data available
Flash point	:	223 °F / 106 °C
Evaporation rate	:	No data available

Flammability (solid, gas)	:	Not applicable
Flammability (liquids)	:	Not applicable
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	No data available
Relative vapor density	:	No data available
Relative density	:	No data available
Density	:	No data available
Solubility(ies)		
Water solubility	:	No data available
Partition coefficient: n-octanol/water	:	No data available
Autoignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity		
Viscosity, kinematic	:	No data available
Explosive properties	:	Not explosive
Oxidizing properties	:	The substance or mixture is not classified as oxidizing.
Molecular weight	:	No data available
Particle size	:	Not applicable

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Not classified as a reactivity hazard.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Can react with strong oxidizing agents.
Conditions to avoid	:	None known.
Incompatible materials	:	Oxidizing agents
Hazardous decomposition products	:	No hazardous decomposition products are known.

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Inhalation
Skin contact
Ingestion
Eye contact

Acute toxicity

Harmful if swallowed.

Product:

Acute oral toxicity : Acute toxicity estimate: 1,505 mg/kg
Method: Calculation method

Components:

Hydrocarbons, C10, aromatics, <1% naphthalene:

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg
Method: OECD Test Guideline 420
Remarks: Based on data from similar materials

Acute inhalation toxicity : LC50 (Rat): > 4.778 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Remarks: Based on data from similar materials

Acute dermal toxicity : LD50 (Rabbit): > 2,000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity
Remarks: Based on data from similar materials

4-Nonylphenol, branched, ethoxylated:

Acute oral toxicity : LD50 (Rat): > 300 - 2,000 mg/kg
Remarks: Based on data from similar materials

Acute dermal toxicity : LD50 (Rabbit): > 2,000 mg/kg

Amitraz (ISO):

Acute oral toxicity : LD50 (Rat): > 400 mg/kg

LD50 (Mouse): > 1,085 mg/kg

LD50 (Guinea pig): > 400 mg/kg

Acute inhalation toxicity : Remarks: No data available

Acute dermal toxicity : LD50 (Rat): > 1,600 mg/kg

Bis(2,6-diisopropylphenyl)carbodiimide:

Acute oral toxicity	:	LD50 (Rat): > 300 - 2,000 mg/kg Method: OECD Test Guideline 423
Acute dermal toxicity	:	LD50 (Rat): > 2,000 mg/kg Method: OECD Test Guideline 402 Assessment: The substance or mixture has no acute dermal toxicity

Skin corrosion/irritation

Not classified based on available information.

Components:

Hydrocarbons, C10, aromatics, <1% naphthalene:

Assessment	:	Repeated exposure may cause skin dryness or cracking.

Amitraz (ISO):

Species	:	Rabbit
Result	:	No skin irritation

Bis(2,6-diisopropylphenyl)carbodiimide:

Species	:	Rabbit
Method	:	OECD Test Guideline 404
Result	:	No skin irritation

Serious eye damage/eye irritation

Causes serious eye irritation.

Components:

Hydrocarbons, C10, aromatics, <1% naphthalene:

Species	:	Rabbit
Result	:	No eye irritation
Remarks	:	Based on data from similar materials

4-Nonylphenol, branched, ethoxylated:

Species	:	Rabbit
Result	:	Irritation to eyes, reversing within 21 days

Amitraz (ISO):

Species	:	Rabbit
Result	:	No eye irritation

Bis(2,6-diisopropylphenyl)carbodiimide:

Species	:	Rabbit
Result	:	No eye irritation
Method	:	OECD Test Guideline 405

Respiratory or skin sensitization

Skin sensitization

Not classified based on available information.

Respiratory sensitization

Not classified based on available information.

Components:

Hydrocarbons, C10, aromatics, <1% naphthalene:

Test Type	:	Maximization Test
Routes of exposure	:	Skin contact
Species	:	Guinea pig
Result	:	negative
Remarks	:	Based on data from similar materials

4-Nonylphenol, branched, ethoxylated:

Test Type	:	Human repeat insult patch test (HRIPT)
Routes of exposure	:	Skin contact
Result	:	negative
Remarks	:	Based on data from similar materials

Amitraz (ISO):

Test Type	:	Maximization Test
Routes of exposure	:	Dermal
Species	:	Guinea pig
Result	:	Not a skin sensitizer.

Bis(2,6-diisopropylphenyl)carbodiimide:

Test Type	:	Maximization Test
Routes of exposure	:	Skin contact
Species	:	Guinea pig
Method	:	OECD Test Guideline 406
Result	:	negative

Germ cell mutagenicity

Not classified based on available information.

Components:

Hydrocarbons, C10, aromatics, <1% naphthalene:

Genotoxicity in vitro	:	Test Type: In vitro sister chromatid exchange assay in mammalian cells Result: negative Remarks: Based on data from similar materials
Genotoxicity in vivo	:	Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis) Species: Rat Application Route: inhalation (vapor) Result: negative

Remarks: Based on data from similar materials

4-Nonylphenol, branched, ethoxylated:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Test Type: DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro)
Result: negative

Amitraz (ISO):

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Test Type: In vitro mammalian cell gene mutation test
Result: negative

Test Type: Chromosome aberration test in vitro
Result: negative

Test Type: DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro)
Result: negative

Bis(2,6-diisopropylphenyl)carbodiimide:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative

Test Type: Chromosome aberration test in vitro
Method: OECD Test Guideline 473
Result: negative

Test Type: In vitro mammalian cell gene mutation test
Method: OECD Test Guideline 476
Result: negative

Carcinogenicity

Not classified based on available information.

Components:

4-Nonylphenol, branched, ethoxylated:

Species	:	Rat
Application Route	:	Ingestion
Exposure time	:	2 Years
Result	:	negative
Remarks	:	Based on data from similar materials

Amitraz (ISO):

Species	:	Rat
Application Route	:	Oral
Exposure time	:	2 Years
NOAEL	:	> 10.18 mg/kg body weight
Result	:	negative

Species	:	Mouse
Exposure time	:	2 Years
LOAEL	:	2.3 mg/kg body weight
Result	:	positive
Target Organs	:	Liver, Stomach

IARC No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

May damage fertility.

Components:

Hydrocarbons, C10, aromatics, <1% naphthalene:

Effects on fertility	:	Test Type: Three-generation reproduction toxicity study Species: Rat Application Route: inhalation (vapor) Result: negative Remarks: Based on data from similar materials
Effects on fetal development	:	Test Type: Embryo-fetal development Species: Rat Application Route: Ingestion Result: negative Remarks: Based on data from similar materials

Amitraz (ISO):

Effects on fertility	:	Test Type: Three-generation reproduction toxicity study Species: Rat Application Route: Oral Fertility: NOAEL: > 4.8 mg/kg body weight Result: No significant adverse effects were reported
Effects on fetal development	:	Test Type: Embryo-fetal development Species: Rat Application Route: Oral Developmental Toxicity: NOAEL: 3 mg/kg body weight Remarks: No significant adverse effects were reported

Test Type: Embryo-fetal development
Species: Rabbit
Application Route: Oral
Developmental Toxicity: NOAEL: 5 mg/kg body weight
Result: Effects on fetal development.

Bis(2,6-diisopropylphenyl)carbodiimide:

Effects on fertility	:	Test Type: Reproduction/Developmental toxicity screening test Species: Rat Application Route: Ingestion Method: OECD Test Guideline 421 Result: positive Test Type: Fertility Species: Rat Application Route: Ingestion Result: positive
Effects on fetal development	:	Test Type: Reproduction/Developmental toxicity screening test Species: Rat Application Route: Ingestion Method: OECD Test Guideline 421 Result: equivocal
Reproductive toxicity - Assessment	:	Clear evidence of adverse effects on sexual function and fertility, based on animal experiments.

STOT-single exposure

May cause drowsiness or dizziness.

Components:

Hydrocarbons, C10, aromatics, <1% naphthalene:

Assessment	:	May cause drowsiness or dizziness.
Remarks	:	Based on data from similar materials

STOT-repeated exposure

Causes damage to organs (Kidney, Heart, Gastrointestinal tract, Lymph nodes) through prolonged or repeated exposure.
May cause damage to organs (Liver, Central nervous system) through prolonged or repeated exposure.

Components:

Amitraz (ISO):

Target Organs	:	Liver, Central nervous system
Assessment	:	May cause damage to organs through prolonged or repeated exposure.

Bis(2,6-diisopropylphenyl)carbodiimide:

Routes of exposure	:	Ingestion
Target Organs	:	Kidney, Heart, Gastrointestinal tract, Lymph nodes
Assessment	:	Causes damage to organs through prolonged or repeated exposure.

Repeated dose toxicity

Components:

Hydrocarbons, C10, aromatics, <1% naphthalene:

Species	:	Rat
NOAEL	:	300 mg/kg
Application Route	:	Ingestion
Exposure time	:	13 Weeks
Remarks	:	Based on data from similar materials

4-Nonylphenol, branched, ethoxylated:

Species	:	Rat
LOAEL	:	> 100 mg/kg
Application Route	:	Ingestion
Exposure time	:	90 Days
Remarks	:	Based on data from similar materials

Amitraz (ISO):

Species	:	Mouse
NOAEL	:	3 mg/kg
Application Route	:	Oral
Exposure time	:	90 Days
Target Organs	:	Liver

Species	:	Dog
NOAEL	:	0.25 mg/kg
Application Route	:	Oral
Exposure time	:	90 Days
Target Organs	:	Central nervous system, Liver

Bis(2,6-diisopropylphenyl)carbodiimide:

Species	:	Rat
NOAEL	:	4 mg/kg
LOAEL	:	16 mg/kg
Application Route	:	Ingestion
Exposure time	:	28 Days
Method	:	OECD Test Guideline 407

Aspiration toxicity

May be fatal if swallowed and enters airways.

Product:

The substance or mixture is known to cause human aspiration toxicity hazards or has to be regarded as if it causes a human aspiration toxicity hazard.

Components:

Hydrocarbons, C10, aromatics, <1% naphthalene:

The substance or mixture is known to cause human aspiration toxicity hazards or has to be regarded as if it causes a human aspiration toxicity hazard.

Experience with human exposure

Components:

Amitraz (ISO):

Ingestion : Target Organs: Central nervous system

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Hydrocarbons, C10, aromatics, <1% naphthalene:

Toxicity to fish : LL50 (Oncorhynchus mykiss (rainbow trout)): 2 - 5 mg/l
Exposure time: 96 h
Test substance: Water Accommodated Fraction
Method: OECD Test Guideline 203
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EL50 (Daphnia magna (Water flea)): 3 - 10 mg/l
Exposure time: 48 h
Test substance: Water Accommodated Fraction
Method: OECD Test Guideline 202
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants : EL50 (Pseudokirchneriella subcapitata (green algae)): > 1 - 3 mg/l
Exposure time: 72 h
Test substance: Water Accommodated Fraction
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

4-Nonylphenol, branched, ethoxylated:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): > 0.1 - 1 mg/l
Exposure time: 96 h
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Ceriodaphnia dubia (water flea)): > 0.1 - 1 mg/l
Exposure time: 48 h
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants	:	ErC50 (Selenastrum capricornutum (green algae)): > 1 - 10 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 Remarks: Based on data from similar materials EC10 (Selenastrum capricornutum (green algae)): > 1 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 Remarks: Based on data from similar materials
Toxicity to fish (Chronic toxicity)	:	NOEC (Oryzias latipes (Japanese medaka)): > 0.1 - 1 mg/l Exposure time: 100 d Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Mysidopsis bahia (opossum shrimp)): > 0.001 - 0.01 mg/l Exposure time: 28 d Remarks: Based on data from similar materials

Amitraz (ISO):

Toxicity to fish	:	LC50 (Lepomis macrochirus (Bluegill sunfish)): 0.45 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 0.035 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	NOEC (Pseudokirchneriella subcapitata (green algae)): 0.04 mg/l Exposure time: 91 h
Toxicity to fish (Chronic toxicity)	:	NOEC (Pimephales promelas (fathead minnow)): 0.00148 mg/l Exposure time: 32 d
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 0.0011 mg/l Exposure time: 21 d

Bis(2,6-diisopropylphenyl)carbodiimide:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): > 0.1 mg/l Exposure time: 96 h Method: OECD Test Guideline 203 Remarks: No toxicity at the limit of solubility.
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 1 mg/l Exposure time: 48 h Method: OECD Test Guideline 202 Remarks: No toxicity at the limit of solubility.
Toxicity to algae/aquatic plants	:	ErC50 (Desmodesmus subspicatus (green algae)): > 1 mg/l Exposure time: 72 h Method: OECD Test Guideline 201

Remarks: No toxicity at the limit of solubility.

NOEC (Desmodesmus subspicatus (green algae)): > 1 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

Toxicity to microorganisms : EC50: > 1,000 mg/l
Exposure time: 3 h
Method: OECD Test Guideline 209

Persistence and degradability

Components:

Hydrocarbons, C10, aromatics, <1% naphthalene:

Biodegradability : Result: Not readily biodegradable.
Biodegradation: 49.56 %
Exposure time: 28 d
Method: OECD Test Guideline 301F

4-Nonylphenol, branched, ethoxylated:

Biodegradability : Result: Not readily biodegradable.
Remarks: Based on data from similar materials

Bis(2,6-diisopropylphenyl)carbodiimide:

Biodegradability : Result: Not readily biodegradable.
Biodegradation: 3 %
Exposure time: 28 d
Method: OECD Test Guideline 301B

Bioaccumulative potential

Components:

4-Nonylphenol, branched, ethoxylated:

Partition coefficient: n-octanol/water : log Pow: < 4

Amitraz (ISO):

Bioaccumulation : Species: Lepomis macrochirus (Bluegill sunfish)
Bioconcentration factor (BCF): 1,333

Partition coefficient: n-octanol/water : log Pow: 5.5

Bis(2,6-diisopropylphenyl)carbodiimide:

Bioaccumulation : Bioconcentration factor (BCF): > 500

Partition coefficient: n-octanol/water : log Pow: > 6.2

Mobility in soil

Components:

Amitraz (ISO):

Distribution among environmental compartments	:	log Koc: 3.3

Other adverse effects

No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Dispose of in accordance with local regulations. Do not dispose of waste into sewer.
Contaminated packaging	:	Empty containers should be taken to an approved waste handling site for recycling or disposal. If not otherwise specified: Dispose of as unused product.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (amitraz (ISO))
Class	:	9
Packing group	:	III
Labels	:	9
Environmentally hazardous	:	yes

IATA-DGR

UN/ID No.	:	UN 3082
Proper shipping name	:	Environmentally hazardous substance, liquid, n.o.s. (Amitraz (ISO))
Class	:	9
Packing group	:	III
Labels	:	Miscellaneous
Packing instruction (cargo aircraft)	:	964
Packing instruction (passenger aircraft)	:	964
Environmentally hazardous	:	yes

IMDG-Code

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Amitraz (ISO))
Class	:	9
Packing group	:	III
Labels	:	9

EmS Code : F-A, S-F
Marine pollutant : yes

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

Domestic regulation

49 CFR

UN/ID/NA number : UN 3082
Proper shipping name : Environmentally hazardous substance, liquid, n.o.s. (Amitraz (ISO))
Class : 9
Packing group : III
Labels : CLASS 9
ERG Code : 171
Marine pollutant : yes(Amitraz (ISO))
Remarks : Above applies only to containers over 119 gallons or 450 liters.
Shipment by ground under DOT is non-regulated; however it may be shipped per the applicable hazard classification to facilitate multi-modal transport involving ICAO (IATA) or IMO.

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Acute toxicity (any route of exposure)
Reproductive toxicity
Specific target organ toxicity (single or repeated exposure)
Aspiration hazard
Serious eye damage or eye irritation

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

4-Nonylphenol, branched, ethoxylated	127087-87-0	>= 10 - < 20 %
Amitraz (ISO)	33089-61-1	>= 10 - < 20 %

US State Regulations

Pennsylvania Right To Know

Hydrocarbons, C10, aromatics, <1% naphthalene	64742-94-5
4-Nonylphenol, branched, ethoxylated	127087-87-0
Amitraz (ISO)	33089-61-1

California Prop. 65

WARNING: This product can expose you to chemicals including Amitraz (ISO), which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

California List of Hazardous Substances

Hydrocarbons, C10, aromatics, <1% naphthalene	64742-94-5

California Permissible Exposure Limits for Chemical Contaminants

Hydrocarbons, C10, aromatics, <1% naphthalene	64742-94-5

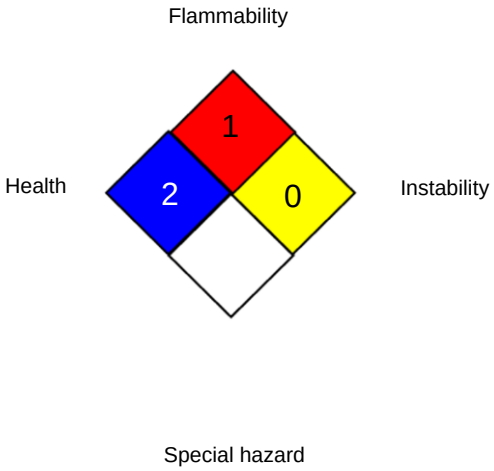
The ingredients of this product are reported in the following inventories:

AICS	:	not determined
DSL	:	not determined
IECSC	:	not determined

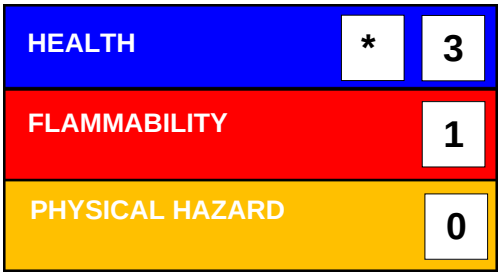
SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:



HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard.

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits

OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA	:	8-hour, time-weighted average
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
NIOSH REL / ST	:	STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday
OSHA Z-1 / TWA	:	8-hour time weighted average

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Sources of key data used to compile the Material Safety Data Sheet	:	Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, http://echa.europa.eu/
Revision Date	:	09/30/2023

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided

relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

US / Z8

Appendix D Borehole Logs

Print PDF

TabLogs

Datanest

Environmental Log - Borehole

BH1

UTM	: 56J	Drill Rig	: Hand Auger	Job Number	: J002075
Latitude	: -27.651300	Driller Supplier	: Range Environmental	Client	: Lockyear Valley Regional Council
Longitude	: 152.397414	Logged By	: LT	Project	: Laidley Saleyards
Ground Elevation	: 0.0001 (m)	Reviewed By	: SD	Location	: 2107 Rosewood Laidley Road, Grandchester QLD, Australia
Total Depth	: 1 m BGL	Date	: 13/09/2024	Loc Comment	:

PID (ppm)	Sample	Moisture	Water Level	Depth (m)	Graphic Log	LITHOLOGICAL DESCRIPTION	COMMENTS / CONTAMINANT INDICATORS	Well Diagram	Elevation (m)
	BH1-1	W				FILL Silty CLAY, Dark brown , medium plasticity, Gravel and sand , wet, soft			0
	BH1-2			0.50		FILL Silty sandy CLAY, light brown , medium plasticity, wet, soft			
	BH1-3					Silty sandy CLAY, medium plasticity, wet, stiff			
				1.50		**BH1 Terminated at 1m (Practical refusal was reached at 1 m.)**			-1
				2					-2
				2.50					
				3					-3
				3.50					

This report must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

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TabLogs

Datanest

Environmental Log - Borehole

BH2

UTM	: 56J	Drill Rig	: Hand Auger	Job Number	: J002075
Latitude	: -27.651272	Driller Supplier	: Range Environmental	Client	: Lockyear Valley Regional Council
Longitude	: 152.397447	Logged By	: LT	Project	: Laidley Saleyards
Ground Elevation	: 0.0001 (m)	Reviewed By	: SD	Location	: 2107 Rosewood Laidley Road, Grandchester QLD, Australia
Total Depth	: 1 m BGL	Date	: 13/09/2024	Loc Comment	:

PID (ppm)	Sample	Moisture	Water Level	Depth (m)	Graphic Log	LITHOLOGICAL DESCRIPTION	COMMENTS / CONTAMINANT INDICATORS	Well Diagram	Elevation (m)
	BH2-1	W		0		FILL Silty sandy CLAY, Dark Brown, medium plasticity, wet, soft			0
	BH2-2			0.50		Silty sandy CLAY, Yellow Brown, medium plasticity, moist, stiff			-1
	BH2-3	M							
				1.50		**BH2 Terminated at 1m (Target depth was reached at 1 m.)**			
				2					-2
				2.50					
				3					-3
				3.50					

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TabLogs

Datanest

Environmental Log - Borehole

BH3

UTM	: 56J	Drill Rig	: Hand Auger	Job Number	: J002075
Latitude	: -27.651327	Driller Supplier	: Range Environmental	Client	: Lockyear Valley Regional Council
Longitude	: 152.397530	Logged By	: LT	Project	: Laidley Saleyards
Ground Elevation	: 0.0001 (m)	Reviewed By	: SD	Location	: 2107 Rosewood Laidley Road, Grandchester QLD, Australia
Total Depth	: 1 m BGL	Date	: 13/09/2024	Loc Comment	:

PID (ppm)	Sample	Moisture	Water Level	Depth (m)	Graphic Log	LITHOLOGICAL DESCRIPTION	COMMENTS / CONTAMINANT INDICATORS	Well Diagram	Elevation (m)
	BH3-1	M				FILL Silty CLAY, Dark Brown, medium plasticity, moist, soft			0
		W				FILL Silty gravelly CLAY, Dark Brown, medium plasticity, wet, stiff			
	BH3-2			0.50					
						Clayey sandy SILT, Yellow Brown, medium plasticity, stiff			
	BH3-3								
						BH3 Terminated at 1m (Target depth was reached at 1 m.)			-1
				1.50					
				2					-2
				2.50					
				3					-3
				3.50					

This report must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

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TabLogs

Datanest

Environmental Log - Borehole

BH4

UTM	: 56J	**Drill Rig**	: Hand Auger	**Job Number**	: J002075
Latitude	: -27.651005	**Driller Supplier**	: Range Environmental	**Client**	: Lockyear Valley Regional Council
Longitude	: 152.397842	**Logged By**	: LT	**Project**	: Laidley Saleyards
Ground Elevation	: 0.0001 (m)	**Reviewed By**	: SD	**Location**	: 2107 Rosewood Laidley Road, Grandchester QLD, Australia
Total Depth	: 1 m BGL	**Date**	: 13/09/2024	**Loc Comment**	:

PID (ppm)	Sample	Moisture	Water Level	Depth (m)	Graphic Log	LITHOLOGICAL DESCRIPTION	COMMENTS / CONTAMINANT INDICATORS	Well Diagram	Elevation (m)
	BH4-1	M		0		FILL Silty sandy CLAY, Pale Brown, medium plasticity, moist, stiff			0
	BH4-2			0.50		Silty sandy CLAY, Pale Brown, medium plasticity, moist, stiff			-1
	BH4-3					**BH4 Terminated at 1m (Target depth was reached at 1 m.)**			
				1.50					-2
				2					
				2.50					-3
				3					
				3.50					

This report must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

Appendix E Laboratory Documentation

CERTIFICATE OF ANALYSIS

Work Order	: **EB2431818**	Page	: 1 of 13
Client	: **RANGE ENVIRONMENTAL CONSULTANTS**	Laboratory	: Environmental Division Brisbane
Contact	: MR LUCAS TALBOT	Contact	: Customer Services EB
Address	: OFFICE A 189 HUME STREET TOOWOOMBA QLD 4350	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ---	Telephone	: +61 7 3243 7222
Project	: J002075	Date Samples Received	: 16-Sep-2024 13:00
Order number	: J002075	Date Analysis Commenced	: 17-Sep-2024
C-O-C number	: ---	Issue Date	: 23-Sep-2024 16:28
Sampler	: LUCAS TALBOT		
Site	: ---		
Quote number	: EN/222		
No. of samples received	: 18		
No. of samples analysed	: 18		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Soil Preparation, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Soil Preparation, Stafford, QLD
Kirsty Watson	Senior Chemist - Organics	Brisbane Soil Preparation, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

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

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

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

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

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

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

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

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EP080 - TRH Volatiles/BTEX: High LCS recovery deemed acceptable as all associated analyte results are less than LOR.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SS1	SS2	SS3	SS4	SS5
			Sampling date / time	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00
Compound	CAS Number	LOR	Unit	EB2431818-001	EB2431818-002	EB2431818-003	EB2431818-004	EB2431818-005
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**17.9**	**11.5**	**8.6**	**9.2**	**24.1**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	SS1	SS2	SS3	SS4	SS5
				Sampling date / time	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00
Compound	CAS Number	LOR	Unit		EB2431818-001	EB2431818-002	EB2431818-003	EB2431818-004	EB2431818-005
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**102**	**104**	**130**	**126**	**124**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**97.0**	**86.6**	**108**	**101**	**108**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**69.4**	**83.0**	**76.9**	**84.5**	**69.5**
Toluene-D8	2037-26-5	0.2	%		**73.2**	**94.6**	**85.5**	**92.1**	**78.0**
4-Bromofluorobenzene	460-00-4	0.2	%		**73.7**	**92.9**	**84.6**	**91.4**	**79.2**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH1-1	BH1-2	BH1-3	BH2-1	BH2-2
				Sampling date / time	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00
Compound	CAS Number	LOR	Unit		EB2431818-006	EB2431818-007	EB2431818-008	EB2431818-009	EB2431818-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		**16.0**	**12.8**	**13.5**	**16.2**	**13.3**
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	<5	<5
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH1-1	BH1-2	BH1-3	BH2-1	BH2-2
				Sampling date / time	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00
Compound	CAS Number	LOR	Unit		EB2431818-006	EB2431818-007	EB2431818-008	EB2431818-009	EB2431818-010
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	----	----	----	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	----	----	----	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	----	----	----	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg		<1	----	----	----	<1
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	----	----	----	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	----	----	----	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	----	----	----	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	----	----	----	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		<0.5	----	----	----	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	----	----	----	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	----	----	----	<0.5
Pentachlorophenol	87-86-5	2	mg/kg		<2	----	----	----	<2
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH1-1	BH1-2	BH1-3	BH2-1	BH2-2
				Sampling date / time	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00
Compound	CAS Number	LOR	Unit		EB2431818-006	EB2431818-007	EB2431818-008	EB2431818-009	EB2431818-010
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**116**	**128**	**134**	**120**	**129**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**98.8**	**104**	**105**	**92.4**	**100**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**87.1**	**----**	**----**	**----**	**98.7**
2-Chlorophenol-D4	93951-73-6	0.5	%		**84.0**	**----**	**----**	**----**	**94.5**
2.4.6-Tribromophenol	118-79-6	0.5	%		**65.9**	**----**	**----**	**----**	**72.5**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**83.8**	**----**	**----**	**----**	**92.3**
Anthracene-d10	1719-06-8	0.5	%		**98.4**	**----**	**----**	**----**	**107**
4-Terphenyl-d14	1718-51-0	0.5	%		**74.2**	**----**	**----**	**----**	**83.7**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**73.3**	**97.5**	**66.8**	**78.0**	**72.7**
Toluene-D8	2037-26-5	0.2	%		**80.1**	**105**	**71.8**	**84.2**	**79.0**
4-Bromofluorobenzene	460-00-4	0.2	%		**78.5**	**108**	**72.4**	**82.9**	**78.6**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH2-3	BH3-1	BH3-2	BH3-3	BH4-1
			Sampling date / time	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00
Compound	CAS Number	LOR	Unit	EB2431818-011	EB2431818-012	EB2431818-013	EB2431818-014	EB2431818-015
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**14.2**	**15.0**	**18.0**	**12.0**	**24.2**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	**6**	<5	<5	**6**
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH2-3	BH3-1	BH3-2	BH3-3	BH4-1
				Sampling date / time	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00
Compound	CAS Number	LOR	Unit		EB2431818-011	EB2431818-012	EB2431818-013	EB2431818-014	EB2431818-015
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		----	----	<0.5	----	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		----	----	<0.5	----	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		----	----	<0.5	----	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg		----	----	<1	----	<1
2-Nitrophenol	88-75-5	0.5	mg/kg		----	----	<0.5	----	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		----	----	<0.5	----	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		----	----	<0.5	----	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		----	----	<0.5	----	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		----	----	<0.5	----	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		----	----	<0.5	----	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		----	----	<0.5	----	<0.5
Pentachlorophenol	87-86-5	2	mg/kg		----	----	<2	----	<2
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH2-3	BH3-1	BH3-2	BH3-3	BH4-1
				Sampling date / time	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00
Compound	CAS Number	LOR	Unit		EB2431818-011	EB2431818-012	EB2431818-013	EB2431818-014	EB2431818-015
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		90.4	90.4	114	96.3	112
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		101	107	87.0	106	82.0
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	----	86.2	----	92.0
2-Chlorophenol-D4	93951-73-6	0.5	%		----	----	83.4	----	92.7
2.4.6-Tribromophenol	118-79-6	0.5	%		----	----	59.6	----	69.7
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	----	82.8	----	90.2
Anthracene-d10	1719-06-8	0.5	%		----	----	96.8	----	105
4-Terphenyl-d14	1718-51-0	0.5	%		----	----	75.3	----	79.8
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		70.3	76.0	69.3	74.6	70.2
Toluene-D8	2037-26-5	0.2	%		77.9	84.0	74.3	82.2	76.2
4-Bromofluorobenzene	460-00-4	0.2	%		78.4	83.6	73.7	84.5	77.6

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH4-2	BH4-3	DUP-1	----	----
			Sampling date / time	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00	----	----
Compound	CAS Number	LOR	Unit	EB2431818-016	EB2431818-017	EB2431818-018	--------	--------
				Result	Result	Result	---	---
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**24.0**	**23.6**	**8.6**	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**6**	**7**	<5	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH4-2	BH4-3	DUP-1	----	----
				Sampling date / time	13-Sep-2024 00:00	13-Sep-2024 00:00	13-Sep-2024 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2431818-016	EB2431818-017	EB2431818-018	--------	--------
					Result	Result	Result	---	---
EP068A: Organochlorine Pesticides (OC) - Continued									
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	----	---
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	<0.05	<0.05	----	---
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	----	---
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	----	---
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	<10	----	---
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	----	---
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	---
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	----	---
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	---
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	----	---
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	<0.2	----	---
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	<0.5	<0.5	----	---
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	----	---
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**78.4**	**95.4**	**94.1**	----	---
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**89.8**	**104**	**106**	----	---
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**75.1**	**77.9**	**74.2**	----	---
Toluene-D8	2037-26-5	0.2	%		**84.2**	**85.6**	**81.8**	----	---
4-Bromofluorobenzene	460-00-4	0.2	%		**84.3**	**85.5**	**83.6**	----	---

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	10	138
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	23	134
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	35	154
2-Chlorophenol-D4	93951-73-6	42	153
2.4.6-Tribromophenol	118-79-6	26	157
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	34	156
Anthracene-d10	1719-06-8	37	153
4-Terphenyl-d14	1718-51-0	42	172
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	53	134
Toluene-D8	2037-26-5	60	131
4-Bromofluorobenzene	460-00-4	59	127

QUALITY CONTROL REPORT

Work Order	: **EB2431818**	Page	: 1 of 10
Client	: **RANGE ENVIRONMENTAL CONSULTANTS**	Laboratory	: Environmental Division Brisbane
Contact	: MR LUCAS TALBOT	Contact	: Customer Services EB
Address	: OFFICE A 189 HUME STREET TOOWOOMBA QLD 4350	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61 7 3243 7222
Project	: J002075	Date Samples Received	: 16-Sep-2024
Order number	: J002075	Date Analysis Commenced	: 17-Sep-2024
C-O-C number	: ----	Issue Date	: 23-Sep-2024
Sampler	: LUCAS TALBOT		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 18		
No. of samples analysed	: 18		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Soil Preparation, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Soil Preparation, Stafford, QLD
Kirsty Watson	Senior Chemist - Organics	Brisbane Soil Preparation, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

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

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

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

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 6061029)									
EB2431818-002	SS2	EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
EB2431730-001	Anonymous	EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 6061031)									
EB2431822-003	Anonymous	EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
EB2431865-003	Anonymous	EG005T: Arsenic	7440-38-2	5	mg/kg	27	27	0.0	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 6061037)									
EB2431795-001	Anonymous	EA055: Moisture Content	----	0.1	%	24.7	25.0	1.3	0% - 20%
EB2431818-007	BH1-2	EA055: Moisture Content	----	0.1 (1.0)*	%	12.8	13.3	3.6	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 6061038)									
EB2431818-017	BH4-3	EA055: Moisture Content	----	0.1 (1.0)*	%	23.6	23.0	2.7	0% - 20%
EP068A: Organochlorine Pesticides (OC) (QC Lot: 6060926)									
EB2431818-001	SS1	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 6060926) - continued									
EB2431818-001	SS1	EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EB2431818-013	BH3-2	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 6060926) - continued									
EB2431818-013	BH3-2	EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 6060993)									
EB2431818-011	BH2-3	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EB2431834-019	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 6060993) - continued									
EB2431834-019	Anonymous	EP068: gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 6060927)									
EB2431818-013	BH3-2	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6059521)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6059521) - continued									
EB2431818-001	SS1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EB2431818-011	BH2-3	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6059521)									
EB2431818-001	SS1	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EB2431818-011	BH2-3	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 6059521)									
EB2431818-001	SS1	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EB2431818-011	BH2-3	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6061029)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	40 mg/kg	101	84.0	123
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6061031)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	40 mg/kg	95.1	84.0	123
EP068A: Organochlorine Pesticides (OC) (QCLot: 6060926)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	107	72.8	127
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	107	71.0	127
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	91.8	67.5	126
EP068: gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	97.4	72.7	127
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	79.9	70.6	122
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	88.9	64.8	127
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	91.5	72.4	122
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	97.2	67.4	125
EP068: Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	----	----	----
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	96.4	65.6	124
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	# 133	70.4	122
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	109	65.6	125
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	99.1	69.1	124
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	94.0	72.4	125
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	95.4	63.2	127
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	102	69.7	120
EP068: Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	----	----	----	----
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	107	61.2	124
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	88.5	55.5	125
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	105	57.1	117
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	91.6	51.9	125
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	97.6	46.5	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	87.8	34.0	130
EP068: Sum of DDD + DDE + DDT	72-54-8/72-5 5-9/50-2	0.05	mg/kg	<0.05	----	----	----	----
EP068: Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	----	----	----

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 6060993)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	89.0	72.8	127
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	84.4	71.0	127
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	88.3	67.5	126
EP068: gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	88.6	72.7	127
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	84.4	70.6	122
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	78.6	64.8	127
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	76.2	72.4	122
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	71.1	67.4	125
EP068: Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	----	----	----
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	73.4	65.6	124
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	74.4	70.4	122
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	74.2	65.6	125
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	81.6	69.1	124
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	77.6	72.4	125
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	76.1	63.2	127
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	71.2	69.7	120
EP068: Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	----	----	----	----
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	83.6	61.2	124
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	74.8	55.5	125
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	71.6	57.1	117
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	75.6	51.9	125
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	72.2	46.5	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	89.8	34.0	130
EP068: Sum of DDD + DDE + DDT	72-54-8/72-5 5-9/50-2	0.05	mg/kg	<0.05	----	----	----	----
EP068: Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	----	----	----
EP075(SIM)A: Phenolic Compounds (QCLot: 6060927)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	1.5 mg/kg	105	78.0	134
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	1.5 mg/kg	105	78.0	132
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	1.5 mg/kg	105	78.0	132
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	3 mg/kg	109	77.2	135
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	1.5 mg/kg	109	42.9	156
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	1.5 mg/kg	110	70.3	141
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	1.5 mg/kg	110	69.9	135

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)A: Phenolic Compounds (QCLot: 6060927) - continued								
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	1.5 mg/kg	111	72.9	136
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	1.5 mg/kg	115	53.3	138
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	1.5 mg/kg	115	50.9	140
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	1.5 mg/kg	97.5	45.5	140
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	3 mg/kg	55.8	20.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6059521)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	18 mg/kg	109	64.0	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6059521)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	22.5 mg/kg	112	58.1	124
EP080: BTEXN (QCLot: 6059521)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	103	68.0	107
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	# 113	69.0	108
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	# 115	68.0	109
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	# 115	70.0	114
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	113	74.0	116
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	96.9	74.0	109

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6061029)							
EB2431730-003	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	81.3	70.0	130
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6061031)							
EB2431818-013	BH3-2	EG005T: Arsenic	7440-38-2	50 mg/kg	89.8	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 6060926)							
EB2431818-002	SS2	EP068: gamma-BHC - (Lindane)	58-89-9	0.5 mg/kg	106	70.0	136
		EP068: Heptachlor	76-44-8	0.5 mg/kg	96.1	65.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	97.2	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	108	67.0	129
		EP068: Endrin	72-20-8	0.5 mg/kg	107	60.0	137
		EP068: 4.4`-DDT	50-29-3	0.5 mg/kg	99.4	70.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 6060993)							
EB2431818-012	BH3-1	EP068: gamma-BHC - (Lindane)	58-89-9	0.5 mg/kg	89.8	70.0	136
		EP068: Heptachlor	76-44-8	0.5 mg/kg	83.4	65.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	85.0	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	87.2	67.0	129
		EP068: Endrin	72-20-8	0.5 mg/kg	84.9	60.0	137
		EP068: 4.4`-DDT	50-29-3	0.5 mg/kg	83.4	70.0	130
EP075(SIM)A: Phenolic Compounds (QCLot: 6060927)							
EB2431818-010	BH2-2	EP075(SIM): Phenol	108-95-2	1.5 mg/kg	101	70.0	130
		EP075(SIM): 2-Chlorophenol	95-57-8	1.5 mg/kg	100	70.0	130
		EP075(SIM): 2-Nitrophenol	88-75-5	1.5 mg/kg	109	42.9	156
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	1.5 mg/kg	111	53.3	138
		EP075(SIM): Pentachlorophenol	87-86-5	3 mg/kg	63.3	20.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6059521)							
EB2431818-002	SS2	EP080: C6 - C9 Fraction	----	8 mg/kg	83.2	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6059521)							
EB2431818-002	SS2	EP080: C6 - C10 Fraction	C6_C10	8 mg/kg	77.4	70.0	130
EP080: BTEXN (QCLot: 6059521)							
EB2431818-002	SS2	EP080: Benzene	71-43-2	2 mg/kg	83.5	70.0	130
		EP080: Toluene	108-88-3	2 mg/kg	91.6	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2431818**	Page	: 1 of 6
Client	: **RANGE ENVIRONMENTAL CONSULTANTS**	Laboratory	: Environmental Division Brisbane
Contact	: MR LUCAS TALBOT	Telephone	: +61 7 3243 7222
Project	: J002075	Date Samples Received	: 16-Sep-2024
Site	: ----	Issue Date	: 23-Sep-2024
Sampler	: LUCAS TALBOT	No. of samples received	: 18
Order number	: J002075	No. of samples analysed	: 18

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP068A: Organochlorine Pesticides (OC)	QC-6060926-002	----	**alpha-Endosulfan**	959-98-8	133 %	70.4-122%	**Recovery greater than upper control limit**
EP080: BTEXN	QC-6059521-002	----	**Toluene**	108-88-3	113 %	69.0-108%	**Recovery greater than upper control limit**
EP080: BTEXN	QC-6059521-002	----	**Ethylbenzene**	100-41-4	115 %	68.0-109%	**Recovery greater than upper control limit**
EP080: BTEXN	QC-6059521-002	----	**meta- & para-Xylene**	108-38-3 106-42-3	115 %	70.0-114%	**Recovery greater than upper control limit**

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055)								
SS1,	SS2,	**13-Sep-2024**	**----**	----	**----**	**17-Sep-2024**	27-Sep-2024	✓
SS3,	SS4,							
SS5,	BH1-1,							
BH1-2,	BH1-3,							
BH2-1,	BH2-2,							
BH2-3,	BH3-1,							
BH3-2,	BH3-3,							
BH4-1,	BH4-2,							
BH4-3,	DUP-1							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
SS1, SS2, SS3, SS4, SS5, BH1-1, BH1-2, BH1-3, BH2-1, BH2-2, BH2-3, BH3-1, BH3-2, BH3-3, BH4-1, BH4-2, BH4-3, DUP-1	**13-Sep-2024**	**17-Sep-2024**	12-Mar-2025	✓	**18-Sep-2024**	12-Mar-2025	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068)							
BH2-3, BH3-1, BH3-3, BH4-2, BH4-3, DUP-1	**13-Sep-2024**	**18-Sep-2024**	27-Sep-2024	✓	**21-Sep-2024**	28-Oct-2024	✓
Soil Glass Jar - Unpreserved (EP068)							
SS1, SS2, SS3, SS4, SS5, BH1-1, BH1-2, BH1-3, BH2-1, BH2-2, BH3-2, BH4-1	**13-Sep-2024**	**18-Sep-2024**	27-Sep-2024	✓	**23-Sep-2024**	28-Oct-2024	✓
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved (EP075(SIM))							
BH1-1, BH2-2, BH3-2	**13-Sep-2024**	**18-Sep-2024**	27-Sep-2024	✓	**20-Sep-2024**	28-Oct-2024	✓
Soil Glass Jar - Unpreserved (EP075(SIM))							
BH4-1	**13-Sep-2024**	**18-Sep-2024**	27-Sep-2024	✓	**21-Sep-2024**	28-Oct-2024	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
SS1, SS2, SS3, SS4, SS5, BH1-1, BH1-2, BH1-3, BH2-1, BH2-2, BH2-3, BH3-1, BH3-2, BH3-3, BH4-1, BH4-2, BH4-3, DUP-1	**13-Sep-2024**	**17-Sep-2024**	27-Sep-2024	✓	**18-Sep-2024**	27-Sep-2024	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080)							
SS1, SS2, SS3, SS4, SS5, BH1-1, BH1-2, BH1-3, BH2-1, BH2-2, BH2-3, BH3-1, BH3-2, BH3-3, BH4-1, BH4-2, BH4-3, DUP-1	**13-Sep-2024**	**17-Sep-2024**	27-Sep-2024	✓	**18-Sep-2024**	27-Sep-2024	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
SS1, SS2, SS3, SS4, SS5, BH1-1, BH1-2, BH1-3, BH2-1, BH2-2, BH2-3, BH3-1, BH3-2, BH3-3, BH4-1, BH4-2, BH4-3, DUP-1	**13-Sep-2024**	**17-Sep-2024**	27-Sep-2024	✓	**18-Sep-2024**	27-Sep-2024	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	3	28	**10.71**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	4	27	**14.81**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	27	**7.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	27	**7.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	27	**7.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2431818**

Client	: **RANGE ENVIRONMENTAL CONSULTANTS**	Laboratory	: Environmental Division Brisbane
Contact	: MR LUCAS TALBOT	Contact	: Customer Services EB
Address	: OFFICE A 189 HUME STREET TOOWOOMBA QLD 4350	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: lucas.talbot@rangeenviro.com.au	E-mail	: ALSEnviro.Brisbane@alsglobal.com
Telephone	: ----	Telephone	: +61 7 3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: J002075	Page	: 1 of 3
Order number	: J002075	Quote number	: EB2017RANENV0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: LUCAS TALBOT		

Dates

Date Samples Received	: 16-Sep-2024 13:00	Issue Date	: 16-Sep-2024
Client Requested Due Date	: 23-Sep-2024	Scheduled Reporting Date	: **23-Sep-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 2.3°C, 4.3°C, 2.5°C - Ice present
Receipt Detail	: HARD ESKY	No. of samples received / analysed	: 18 / 18

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Unless otherwise stated, analytical work for this work order will be conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818.
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- **Sample "TRIP-1" has been forwarded to ALS Sydney , as requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **SOIL**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	SOIL - EA055-103 Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP068A (solids) Organochlorine Pesticides by GCMS	SOIL - EP075 SIM Phenols only SIM - Phenols only	SOIL - S-18 TRH(C6-C9)/BTEXN
EB2431818-001	13-Sep-2024 00:00	SS1	✓	✓	✓		✓
EB2431818-002	13-Sep-2024 00:00	SS2	✓	✓	✓		✓
EB2431818-003	13-Sep-2024 00:00	SS3	✓	✓	✓		✓
EB2431818-004	13-Sep-2024 00:00	SS4	✓	✓	✓		✓
EB2431818-005	13-Sep-2024 00:00	SS5	✓	✓	✓		✓
EB2431818-006	13-Sep-2024 00:00	BH1-1	✓	✓	✓	✓	✓
EB2431818-007	13-Sep-2024 00:00	BH1-2	✓	✓	✓		✓
EB2431818-008	13-Sep-2024 00:00	BH1-3	✓	✓	✓		✓
EB2431818-009	13-Sep-2024 00:00	BH2-1	✓	✓	✓		✓
EB2431818-010	13-Sep-2024 00:00	BH2-2	✓	✓	✓	✓	✓
EB2431818-011	13-Sep-2024 00:00	BH2-3	✓	✓	✓		✓
EB2431818-012	13-Sep-2024 00:00	BH3-1	✓	✓	✓		✓
EB2431818-013	13-Sep-2024 00:00	BH3-2	✓	✓	✓	✓	✓
EB2431818-014	13-Sep-2024 00:00	BH3-3	✓	✓	✓		✓
EB2431818-015	13-Sep-2024 00:00	BH4-1	✓	✓	✓	✓	✓
EB2431818-016	13-Sep-2024 00:00	BH4-2	✓	✓	✓		✓
EB2431818-017	13-Sep-2024 00:00	BH4-3	✓	✓	✓		✓
EB2431818-018	13-Sep-2024 00:00	DUP-1	✓	✓	✓		✓

Proactive Holding Time Report

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

Requested Deliverables

All Invoices

- A4 - AU Tax Invoice (INV)	Email	rangeenviro.suppliers@receiptbank.me

LUCAS TALBOT

- *AU Certificate of Analysis - NATA (COA)	Email	lucas.talbot@rangeenviro.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	lucas.talbot@rangeenviro.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	lucas.talbot@rangeenviro.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	lucas.talbot@rangeenviro.com.au
- Chain of Custody (CoC) (COC)	Email	lucas.talbot@rangeenviro.com.au
- EDI Format - ESDAT (ESDAT)	Email	lucas.talbot@rangeenviro.com.au
- EDI Format - XTab (XTAB)	Email	lucas.talbot@rangeenviro.com.au

RANGE ENVIRO

- EDI Format - ESDAT (ESDAT)	Email	rangeenviro@esdat.com.au

Samples

- *AU Certificate of Analysis - NATA (COA)	Email	samples@rangeenviro.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	samples@rangeenviro.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	samples@rangeenviro.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	samples@rangeenviro.com.au
- Chain of Custody (CoC) (COC)	Email	samples@rangeenviro.com.au
- EDI Format - ESDAT (ESDAT)	Email	samples@rangeenviro.com.au
- EDI Format - XTab (XTAB)	Email	samples@rangeenviro.com.au

CHAIN OF CUSTODY

ALS Laboratory: please tick →

Environmental Division
Brisbane
Work Order Reference
EB2431818

CLIENT:	Range Environmental	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Standard TAT (List due date):
OFFICE:	Toowoomba		☐ Non Standard or urgent TAT (List due date):
PROJECT:	J002075	ALS QUOTE NO.: EN/2222/24	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4
ORDER NUMBER:	J002075		OF: 1 2 3 4
PROJECT MANAGER:	Lucas Talbot	CONTACT PH: 0428918007	
SAMPLER:	Lucas Talbot	SAMPLER MOBILE: 0428918007	RELINQUISHED BY: IK 16/9
COC emailed to ALS? (	Yes	EDD FORMAT (or default):	*Lucas Talbot*
Email Reports to (will default to PM if no other addresses are listed): samples@rangeenviro.com.au, rangeenviro@esdat.com.au			DATE/TIME: 1300.
Email Invoice to (will default to PM if no other addresses are listed): rangeenviro.suppliers@receiptbank.me			16/9/24

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: ANALYSIS BY BRISBANE LAB

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB: Suite Codes must be listed to attract suite price) When Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Arsenic	TRH (C6-C10) + BTEXN (S-18)	Phenols (EP075 SIM PHENOLS)	OCP (EP068A)					Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	SS1	13/09/2024	S	Jar	1	Y	Y		Y					
2	SS2	13/09/2024	S	Jar	1	Y	Y		Y					
3	SS3	13/09/2024	S	Jar	1	Y	Y		Y					
4	SS4	13/09/2024	S	Jar	1	Y	Y		Y					
5	SS5	13/09/2024	S	Jar	1	Y	Y		Y					
6	BH1-1	13/09/2024	S	Jar	1	Y	Y	Y	Y					
7	BH1-2	13/09/2024	S	Jar	1	Y	Y		Y					
8	BH1-3	13/09/2024	S	Jar	1	Y	Y		Y					
9	BH2-1	13/09/2024	S	Jar	1	Y	Y		Y					
10	BH2-2	13/09/2024	S	Jar	1	Y	Y	Y	Y					
11	BH2-3	13/09/2024	S	Jar	1	Y	Y		Y					
12	BH3-1	13/09/2024	S	Jar	1	Y	Y		Y					
13	BH3-2	13/09/2024	S	Jar	1	Y	Y	Y	Y					
14	BH3-3	13/09/2024	S	Jar	1	Y	Y		Y					
15	BH4-1	13/09/2024	S	Jar	1	Y	Y	Y	Y					
16	BH4-2	13/09/2024	S	Jar	1	Y	Y		Y					
17	BH4-3	13/09/2024	S	Jar	1	Y	Y		Y					
18	DUP-1	13/09/2024	S	jar	1	Y	Y		Y					
				TOTAL	18									

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

CERTIFICATE OF ANALYSIS

Work Order	: **ES2430750**	Page	: 1 of 5
Client	: **RANGE ENVIRONMENTAL CONSULTANTS**	Laboratory	: Environmental Division Sydney
Contact	: Samples	Contact	: Customer Services ES
Address	: OFFICE A 189 HUME STREET TOOWOOMBA QLD 4350	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: J002075	Date Samples Received	: 17-Sep-2024 17:30
Order number	: J002075	Date Analysis Commenced	: 20-Sep-2024
C-O-C number	: ----	Issue Date	: 25-Sep-2024 12:28
Sampler	: LUCAS TALBOT		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above LOR.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TRIP-1	----	----	----	----
			Sampling date / time	13-Sep-2024 00:00	——	——	——	——
Compound	CAS Number	LOR	Unit	ES2430750-001	------	------	------	------
				Result	---	--	---	---
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	——	1.0	%	8.2	——	——	——	——
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	——	——	——	——
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	——	——	——	——
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	——	——	——	——
beta-BHC	319-85-7	0.05	mg/kg	<0.05	——	——	——	——
gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	——	——	——	——
delta-BHC	319-86-8	0.05	mg/kg	<0.05	——	——	——	——
Heptachlor	76-44-8	0.05	mg/kg	<0.05	——	——	——	——
Aldrin	309-00-2	0.05	mg/kg	<0.05	——	——	——	——
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	——	——	——	——
^ Total Chlordane (sum)	——	0.05	mg/kg	<0.05	——	——	——	——
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	——	——	——	——
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	——	——	——	——
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	——	——	——	——
Dieldrin	60-57-1	0.05	mg/kg	<0.05	——	——	——	——
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	——	——	——	——
Endrin	72-20-8	0.05	mg/kg	<0.05	——	——	——	——
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	——	——	——	——
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	——	——	——	——
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	——	——	——	——
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	——	——	——	——
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	——	——	——	——
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	——	——	——	——
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	——	——	——	——
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	——	——	——	——

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TRIP-1	----	----	----	----
				Sampling date / time	13-Sep-2024 00:00	---	---	---	---
Compound	CAS Number	LOR	Unit		ES2430750-001	------	------	------	------
					Result	---	---	---	---
EP068A: Organochlorine Pesticides (OC) - Continued									
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.05	---	---	---	---
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	---	---	---	---
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	10	mg/kg		<10	---	---	---	---
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	---	---	---	---
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	---	---	---	---
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	---	---	---	---
Toluene	108-88-3	0.5	mg/kg		<0.5	---	---	---	---
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	---	---	---	---
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	---	---	---	---
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	---	---	---	---
^ **Sum of BTEX**	---	0.2	mg/kg		<0.2	---	---	---	---
^ **Total Xylenes**	---	0.5	mg/kg		<0.5	---	---	---	---
Naphthalene	91-20-3	1	mg/kg		<1	---	---	---	---
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**102**	---	---	---	---
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**77.1**	---	---	---	---
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**85.2**	---	---	---	---
Toluene-D8	2037-26-5	0.2	%		**94.0**	---	---	---	---
4-Bromofluorobenzene	460-00-4	0.2	%		**111**	---	---	---	---

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	63	125
Toluene-D8	2037-26-5	67	124
4-Bromofluorobenzene	460-00-4	66	131

QUALITY CONTROL REPORT

Work Order	: **ES2430750**	Page	: 1 of 5
Client	: **RANGE ENVIRONMENTAL CONSULTANTS**	Laboratory	: Environmental Division Sydney
Contact	: Samples	Contact	: Customer Services ES
Address	: OFFICE A 189 HUME STREET TOOWOOMBA QLD 4350	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: J002075	Date Samples Received	: 17-Sep-2024
Order number	: J002075	Date Analysis Commenced	: 20-Sep-2024
C-O-C number	: ----	Issue Date	: 25-Sep-2024
Sampler	: LUCAS TALBOT		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 6073705)									
ES2430574-001	Anonymous	EG005T: Arsenic	7440-38-2	5	mg/kg	15	19	19.4	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 6073707)									
ES2430725-001	Anonymous	EA055: Moisture Content	----	0.1 (1.0)*	%	13.4	13.0	3.0	0% - 50%
EP068A: Organochlorine Pesticides (OC) (QC Lot: 6067240)									
ES2430748-002	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 6067240) - continued									
ES2430748-002	Anonymous	EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6069048)									
ES2430494-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES2430574-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6069048)									
ES2430494-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2430574-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 6069048)									
ES2430494-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES2430574-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6073705)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	106	88.0	113
EP068A: Organochlorine Pesticides (OC) (QCLot: 6067240)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	89.0	69.0	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	91.9	65.0	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	90.5	67.0	119
EP068: gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	93.3	68.0	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	87.8	65.0	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	90.3	67.0	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	87.8	69.0	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	86.9	62.0	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	87.7	63.0	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	87.8	66.0	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	91.5	64.0	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	87.3	66.0	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	87.8	67.0	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	90.1	67.0	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	84.2	69.0	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	87.5	69.0	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	87.8	56.0	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	93.4	62.0	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	87.7	66.0	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	94.9	64.0	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	93.0	54.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6069048)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	93.6	72.2	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6069048)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	90.8	72.4	133
EP080: BTEXN (QCLot: 6069048)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	90.1	76.0	124
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	95.5	78.5	121

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS: Spike Recovery (%)	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP080: BTEXN (QCLot: 6069048) - continued								
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	91.8	77.4	121
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	98.7	78.2	121
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	99.7	81.3	121
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	100	78.8	122

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6073705)							
ES2430574-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	100	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 6067240)							
ES2430748-002	Anonymous	EP068: gamma-BHC - (Lindane)	58-89-9	0.5 mg/kg	112	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	108	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	92.8	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	98.6	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	106	70.0	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	114	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6069048)							
ES2430494-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	85.0	60.4	142
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6069048)							
ES2430494-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	80.7	61.1	142
EP080: BTEXN (QCLot: 6069048)							
ES2430494-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	101	62.1	122
		EP080: Toluene	108-88-3	2.5 mg/kg	96.7	66.6	119
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	101	67.4	123
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	99.5	66.4	121
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	105	70.7	121
		EP080: Naphthalene	91-20-3	2.5 mg/kg	83.5	61.1	115

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2430750**	Page	: 1 of 4
Client	: **RANGE ENVIRONMENTAL CONSULTANTS**	Laboratory	: Environmental Division Sydney
Contact	: Samples	Telephone	: +61-2-8784 8555
Project	: J002075	Date Samples Received	: 17-Sep-2024
Site	: ----	Issue Date	: 25-Sep-2024
Sampler	: LUCAS TALBOT	No. of samples received	: 1
Order number	: J002075	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055)							
TRIP-1	**13-Sep-2024**	**----**	----	----	**23-Sep-2024**	27-Sep-2024	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
TRIP-1	**13-Sep-2024**	**23-Sep-2024**	12-Mar-2025	✓	**24-Sep-2024**	12-Mar-2025	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068)							
TRIP-1	**13-Sep-2024**	**20-Sep-2024**	27-Sep-2024	✓	**23-Sep-2024**	30-Oct-2024	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
TRIP-1	**13-Sep-2024**	**20-Sep-2024**	27-Sep-2024	✓	**20-Sep-2024**	27-Sep-2024	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080)							
TRIP-1	**13-Sep-2024**	**20-Sep-2024**	27-Sep-2024	✓	**20-Sep-2024**	27-Sep-2024	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
TRIP-1	**13-Sep-2024**	**20-Sep-2024**	27-Sep-2024	✓	**20-Sep-2024**	27-Sep-2024	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Pesticides by GCMS	EP068	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Pesticides by GCMS	EP068	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Pesticides by GCMS	EP068	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM Schedule B(3).
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **ES2430750**		
Client	: **RANGE ENVIRONMENTAL CONSULTANTS**	Laboratory	: Environmental Division Sydney
Contact	: Samples	Contact	: Customer Services ES
Address	: OFFICE A 189 HUME STREET TOOWOOMBA QLD 4350	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: samples@rangeenviro.com.au	E-mail	: ALSEnviro.Sydney@ALSGlobal.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: J002075	Page	: 1 of 2
Order number	: J002075	Quote number	: EB2017RANENV0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: LUCAS TALBOT		

Dates

Date Samples Received	: 17-Sep-2024 17:30	Issue Date	: 19-Sep-2024
Client Requested Due Date	: 25-Sep-2024	Scheduled Reporting Date	: **25-Sep-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 3.4'C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Sydney, NATA accreditation no. 825, site no. 10911.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP068A (solids) Organochlorine Pesticides by GCMS	SOIL - S-18 TRH(C6-C9)/BTEXN
ES2430750-001	13-Sep-2024 00:00	TRIP-1	✓	✓	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

All Invoices

- A4 - AU Tax Invoice (INV)	Email	rangeenviro.suppliers@receiptbank.me

RANGE ENVIRO

- EDI Format - ESDAT (ESDAT)	Email	rangeenviro@esdat.com.au

Samples

- *AU Certificate of Analysis - NATA (COA)	Email	samples@rangeenviro.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	samples@rangeenviro.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	samples@rangeenviro.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	samples@rangeenviro.com.au
- Chain of Custody (CoC) (COC)	Email	samples@rangeenviro.com.au
- EDI Format - ESDAT (ESDAT)	Email	samples@rangeenviro.com.au
- EDI Format - XTab (XTAB)	Email	samples@rangeenviro.com.au

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney 277 Woodpark Rd Smithfield NSW 2176 Ph 02 8784 8555 E samples.sydney@alsenviro.com
☐ Brisbane 32 Shand St Stafford QLD 4053 Ph 07 3243 7222 E samples.brisbane@alsenviro.com
☐ Melbourne 4 Westall Rd Springvale VIC 3171 Ph 03 8549 9600 E samples.melbourne@alsenviro.com
☐ Perth 10 Hod Way Malaga WA 6090 Ph 08 9209 7655 E samples.perth@alsenviro.com
☐ Newcastle 5 Rosaulin Rd Warabrook NSW 2304 Ph 02 4968 9433 E samples.newcastle@alsenviro.com
☐ Townsville 14-15 Desma Ct Bohle QLD 4818 Ph 07 4796 0600 E townsville.environmental@alsenviro.com
☐ Adelaide 2-4 Burma Rd Pooraka SA 5095 Ph 08 8359 0890 E adelaide@alsenviro.com
☐ Launceston 27 Wellington St Launceston TAS 7250 Ph 03 6331 2156 E launceston@alsenviro.com

CLIENT:	Range Environmental	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT (List due date):		
OFFICE:	Toowoomba		☐ Non Standard or urgent TAT (List due date):		
PROJECT:	J002075	**ALS QUOTE NO.:**	EN/2222/24	**COC SEQUENCE NUMBER (Circle)**	
ORDER NUMBER:	J002075			COC: 1 2 3 4	
PROJECT MANAGER:	Lucas Talbot	**CONTACT PH:** 0428918007		OF: 1 2 3 4	
SAMPLER:	Lucas Talbot	**SAMPLER MOBILE:** 0428918007	**RELINQUISHED BY:**	**RECEIVED BY:**	
COC emailed to ALS?	Yes	**EDD FORMAT (or default):**	*Lucas Talbot*		
Email Reports to (will default to PM if no other addresses are listed):	samples@rangeenviro.com.au, rangeenviro@esdat.com.au		DATE/TIME: 13/9/24 1600	DATE/TIME: 17/9/24 1730	
Email Invoice to (will default to PM if no other addresses are listed):	rangeenviro.suppliers@receiptbank.me				

Yes No N/A
Yes No N/A
°C

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: ANALYSIS BY SYDNEY LAB

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Arsenic	TRH (C6-C10) + BTEXN (S-18)	OCP (EP068A)						Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	TRIP-1	13/09/2024	S	Jar	1	Y	Y	Y						
				TOTAL	1	0	0	0	0	0	0	0	0	ES2430750

Environmental Division
Sydney
Work Order Reference
ES2430750

Telephone : +61-2-8784 8555

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

Appendix F Results Summary

Soil table 1: Metals

	Arsenic
	mg/kg
Limit Of Reporting	5
NEPM 2013 HILS NEPM 2013 Table 1A(1) (HILs) Res A Soil	100
NEPM 2013 Site-specific EILs for Urban Res	NA
NEPM 2013 EILS NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space	100

Lab Title	Sample ID	Sampled Date	Depth	
EB2431818001	SS1	13/09/2024	0.15-0.24	<5
EB2431818002	SS2	13/09/2024	0.15-0.24	<5
EB2431818003	SS3	13/09/2024	0.15-0.24	<5
EB2431818004	SS4	13/09/2024	0.15-0.24	<5
EB2431818018	DUP-1	13/09/2024	0.15-0.24	<5
EB2431818005	SS5	13/09/2024	0.15-0.24	<5
EB2431818006	BH1-1	13/09/2024	0.15-0.24	<5
EB2431818007	BH1-2	13/09/2024	0.24-0.55	<5
EB2431818008	BH1-3	13/09/2024	0.55-1.0	<5
EB2431818009	BH2-1	13/09/2024	0.15-0.24	<5
EB2431818010	BH2-2	13/09/2024	0.24-0.55	<5
EB2431818011	BH2-3	13/09/2024	0.55-1.0	<5
EB2431818012	BH3-1	13/09/2024	0.15-0.24	6
EB2431818013	BH3-2	13/09/2024	0.24-0.55	<5
EB2431818014	BH3-3	13/09/2024	0.55-1.0	<5
EB2431818015	BH4-1	13/09/2024	0.15-0.24	6
EB2431818016	BH4-2	13/09/2024	0.24-0.55	6
EB2431818017	BH4-3	13/09/2024	0.55-1.0	7

NA - Not Available

Soil table 2: Total Recoverable Hydrocarbons

				al Recoverable Hydrocarb	
				C6 - C10 Fraction	C6 - C10 Fraction minus BTEX (F1)
				mg/kg	mg/kg
Limit Of Reporting				**10**	**10**
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil				NA	800
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Silt (0-1m)				NA	40
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Silt (1-2m)				NA	65
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Silt (2-4m)				NA	100
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Silt (>4m)				NA	190
NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil (0-2m)				NA	180
Lab Title	**Sample ID**	**Sampled Date**	**Depth**		
EB2431818001	**SS1**	**13/09/2024**	**0.15-0.24**	<10	<10
EB2431818002	**SS2**	**13/09/2024**	**0.15-0.24**	<10	<10
EB2431818003	**SS3**	**13/09/2024**	**0.15-0.24**	<10	<10
EB2431818004	**SS4**	**13/09/2024**	**0.15-0.24**	<10	<10
EB2431818018	**DUP-1**	**13/09/2024**	**0.15-0.24**	<10	<10
EB2431818005	**SS5**	**13/09/2024**	**0.15-0.24**	<10	<10
EB2431818006	**BH1-1**	**13/09/2024**	**0.15-0.24**	<10	<10
EB2431818007	**BH1-2**	**13/09/2024**	**0.24-0.55**	<10	<10
EB2431818008	**BH1-3**	**13/09/2024**	**0.55-1.0**	<10	<10
EB2431818009	**BH2-1**	**13/09/2024**	**0.15-0.24**	<10	<10
EB2431818010	**BH2-2**	**13/09/2024**	**0.24-0.55**	<10	<10
EB2431818011	**BH2-3**	**13/09/2024**	**0.55-1.0**	<10	<10
EB2431818012	**BH3-1**	**13/09/2024**	**0.15-0.24**	<10	<10
EB2431818013	**BH3-2**	**13/09/2024**	**0.24-0.55**	<10	<10
EB2431818014	**BH3-3**	**13/09/2024**	**0.55-1.0**	<10	<10
EB2431818015	**BH4-1**	**13/09/2024**	**0.15-0.24**	<10	<10
EB2431818016	**BH4-2**	**13/09/2024**	**0.24-0.55**	<10	<10
EB2431818017	**BH4-3**	**13/09/2024**	**0.55-1.0**	<10	<10

NA - Not Available

NL - Non Limiting

Soil table 3: BTEXN

				BTEXN							
				Naphthalene (VOC	Benzene	Toluene	Ethylbenzene	Xylene, m- & p-	Xylene, o-	Total Xylenes	Sum of BTEX
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit Of Reporting				**1**	**0.2**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.2**
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Silt (0-1m)				4	0.6	390	NL	NA	NA	95	NA
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Silt (1-2m)				NL	0.7	NL	NL	NA	NA	210	NA
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Silt (2-4m)				NL	1	NL	NL	NA	NA	NL	NA
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Silt (>4m)				NL	2	NL	NL	NA	NA	NL	NA
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space				170	NA	NA	NA	NA	NA	NA	NA
NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil (0-2m)				NA	65	105	125	NA	NA	45	NA
Lab Title	**Sample ID**	**Sampled Date**	**Depth**								
EB2431818001	**SS1**	**13/09/2024**	**0.15-0.24**	< 1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2
EB2431818002	**SS2**	**13/09/2024**	**0.15-0.24**	< 1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2
EB2431818003	**SS3**	**13/09/2024**	**0.15-0.24**	< 1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2
EB2431818004	**SS4**	**13/09/2024**	**0.15-0.24**	< 1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2
EB2431818018	**DUP-1**	**13/09/2024**	**0.15-0.24**	< 1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2
EB2431818005	**SS5**	**13/09/2024**	**0.15-0.24**	< 1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2
EB2431818006	**BH1-1**	**13/09/2024**	**0.15-0.24**	< 1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2
EB2431818007	**BH1-2**	**13/09/2024**	**0.24-0.55**	< 1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2
EB2431818008	**BH1-3**	**13/09/2024**	**0.55-1.0**	< 1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2
EB2431818009	**BH2-1**	**13/09/2024**	**0.15-0.24**	< 1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2
EB2431818010	**BH2-2**	**13/09/2024**	**0.24-0.55**	< 1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2
EB2431818011	**BH2-3**	**13/09/2024**	**0.55-1.0**	< 1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2
EB2431818012	**BH3-1**	**13/09/2024**	**0.15-0.24**	< 1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2
EB2431818013	**BH3-2**	**13/09/2024**	**0.24-0.55**	< 1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2
EB2431818014	**BH3-3**	**13/09/2024**	**0.55-1.0**	< 1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2
EB2431818015	**BH4-1**	**13/09/2024**	**0.15-0.24**	< 1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2
EB2431818016	**BH4-2**	**13/09/2024**	**0.24-0.55**	< 1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2
EB2431818017	**BH4-3**	**13/09/2024**	**0.55-1.0**	< 1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2

NA - Not Available
NL - Non Limiting

Soil table 4: Organochlorine Pesticides

				Organochlorine Pesticides																										
				Hexachlorobenzene	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg						
Limit Of Reporting				**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.2**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.2**
NEPM 2013 HILS NEPM 2013 Table 1A(1) (HILs) Res A Soil				10	NA	NA	NA	6	NA	50	NA	NA	NA	NA	NA	240	NA	270	NA	NA	NA	10	NA	NA	NA	6	NA	300
Lab Title	**Sample ID**	**Sampled Date**	**Depth**																										
EB2431818001	**SS1**	**13/09/2024**	**0.15-0.24**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
EB2431818002	**SS2**	**13/09/2024**	**0.15-0.24**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
EB2431818003	**SS3**	**13/09/2024**	**0.15-0.24**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
EB2431818004	**SS4**	**13/09/2024**	**0.15-0.24**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
EB2431818018	**DUP-1**	**13/09/2024**	**0.15-0.24**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
EB2431818005	**SS5**	**13/09/2024**	**0.15-0.24**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
EB2431818006	**BH1-1**	**13/09/2024**	**0.15-0.24**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
EB2431818007	**BH1-2**	**13/09/2024**	**0.24-0.55**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
EB2431818008	**BH1-3**	**13/09/2024**	**0.55-1.0**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
EB2431818009	**BH2-1**	**13/09/2024**	**0.15-0.24**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
EB2431818010	**BH2-2**	**13/09/2024**	**0.24-0.55**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
EB2431818011	**BH2-3**	**13/09/2024**	**0.55-1.0**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
EB2431818012	**BH3-1**	**13/09/2024**	**0.15-0.24**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
EB2431818013	**BH3-2**	**13/09/2024**	**0.24-0.55**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
EB2431818014	**BH3-3**	**13/09/2024**	**0.55-1.0**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
EB2431818015	**BH4-1**	**13/09/2024**	**0.15-0.24**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
EB2431818016	**BH4-2**	**13/09/2024**	**0.24-0.55**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
EB2431818017	**BH4-3**	**13/09/2024**	**0.55-1.0**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2

NA - Not Available

Soil table 5: Phenols

				Phenols											
				3&4-Methylphenol (m&p-cresol	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,6-Dichlorophenol	2-Chlorophenol	2-Methylphenol	2-Nitrophenol	4-chloro-3-methylphenol	Pentachlorophenol	Phenol
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit Of Reporting				**1**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**2**	**0.5**
NEPM 2013 HILS NEPM 2013 Table 1A(1) (HILs) Res A Soil				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	100	3,000
Lab Title	**Sample ID**	**Sampled Date**	**Depth**												
EB2431818006	**BH1-1**	**13/09/2024**	**0.15-0.24**	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5
EB2431818010	**BH2-2**	**13/09/2024**	**0.24-0.55**	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5
EB2431818013	**BH3-2**	**13/09/2024**	**0.24-0.55**	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5
EB2431818015	**BH4-1**	**13/09/2024**	**0.15-0.24**	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5

NA - Not Available

Soil table 6: Field Duplicate & Triplicate Results

TRH (mg/kg)

Sample	Description	Date	C6 - C10	C6 - C10 (F1)
SS4	Primary Sample	13/09/2024	<10	<10
DUP-1	Blind Duplicate Sample	13/09/2024	<10	<10
TRIP-1	Split Triplicate Sample	13/09/2024		
Relative Percent Difference (% RPD) (blind duplicate)			NA	NA
Relative Percent Difference (% RPD) (split)			NA	NA

Metals and Metalloids (mg/kg)

Sample	Description	Date	Arsenic
SS4	Primary Sample	13/09/2024	< 5
DUP-1	Blind Duplicate Sample	13/09/2024	< 5
TRIP-1	Split Triplicate Sample	13/09/2024	
Relative Percent Difference (% RPD) (blind duplicate)			NA
Relative Percent Difference (% RPD) (split)			NA

BTEXN (mg/kg)

Sample	Description	Date	Benzene	Toluene	Ethylbenzene	meta- & para-Xylene	ortho-Xylene	Total Xylenes	sum of BTEX	Naphthalene
SS4	Primary Sample	13/09/2024	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<1
DUP-1	Blind Duplicate Sample	13/09/2024	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<1
TRIP-1	Split Triplicate Sample	13/09/2024								
Relative Percent Difference (% RPD) (blind duplicate)			NA	NA	NA	NA	NA	NA	NA	NA
Relative Percent Difference (% RPD) (split)			NA	NA	NA	NA	NA	NA	NA	NA

OC Pesticides (mg/kg)

Sample	Description	Date	Hexachlorobenzene	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor
SS4	Primary Sample	13/09/2024	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
DUP-1	Blind Duplicate Sample	13/09/2024	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
TRIP-1	Split Triplicate Sample	13/09/2024																									
Relative Percent Difference (% RPD) (blind duplicate)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Relative Percent Difference (% RPD) (split)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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