PLAN 4

PLANNING APPLICATION PLN-21-0020

77-79 MAIN STREET, CRESSY

ATTACHMENTS

A Application & plans

B Referral responses

C Representation

1-309

PLANNING APPLICATION

Proposal

Description of proposal: VISITOR ACCOMMODATION & SUBDIVISION (2 LOTS) 4/3/21 GD

(attach additional sheets if necessary)

If applying for a subdivision which creates a new road, please supply three proposed names for the road, in order of preference:

1. N/A. 2. ..... 3. .....

Site address: 77-79 MAIN ST. CRESSY

CT no: VOL ..... FOL .....

Estimated cost of project $50,000- *(include cost of landscaping, car parks etc for commercial/industrial uses)*

Are there any existing buildings on this property? (Yes) / No

If yes – main building is used as .....

If variation to Planning Scheme provisions requested, justification to be provided:

(attach additional sheets if necessary)

Is any signage required? NO.

(if yes, provide details)

EXHIBITED

the List...

FOLIO PLAN

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

APPROVED 23 OCT 1992 RECORDER OF TITLES	CONVERSION PLAN CONVERTED FROM 50/3793	REGISTERED NUMBER D.102668
FILE NUMBER A11386	GRANTEE: PART OF 100-0-0 LOC. TO WILLIAM BRUMBY	DRAWN B.Q.E. 20-10-92

SKETCH BY WAY OF ILLUSTRATION ONLY

~~CITY~~/TOWN OF CRESSY
~~LAND DISTRICT OF~~
~~PARISH OF~~
LENGTHS ARE IN METRES. NOT TO SCALE.
~~LENGTHS IN BRACKETS IN LINKS/FEET & INCHES.~~

TASMAP MUNICIPAL CODE NO. 56	LAST TASMAP UPI NO.	LAST SURVEY PLAN NO.
ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN		

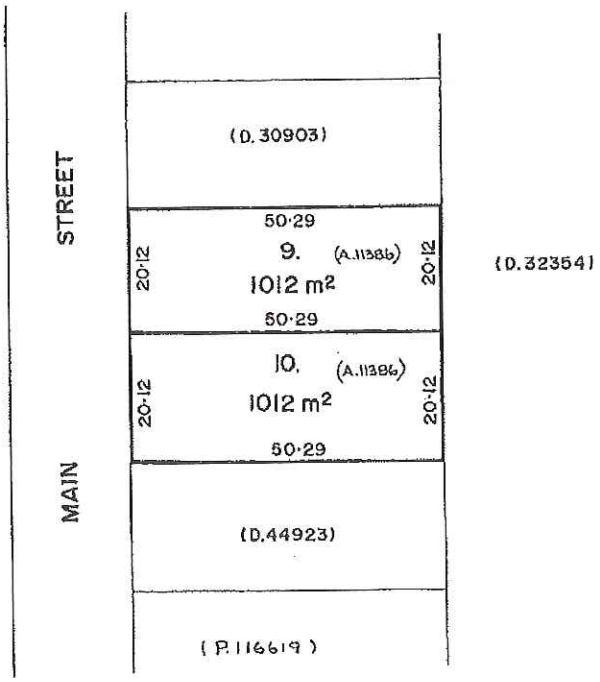
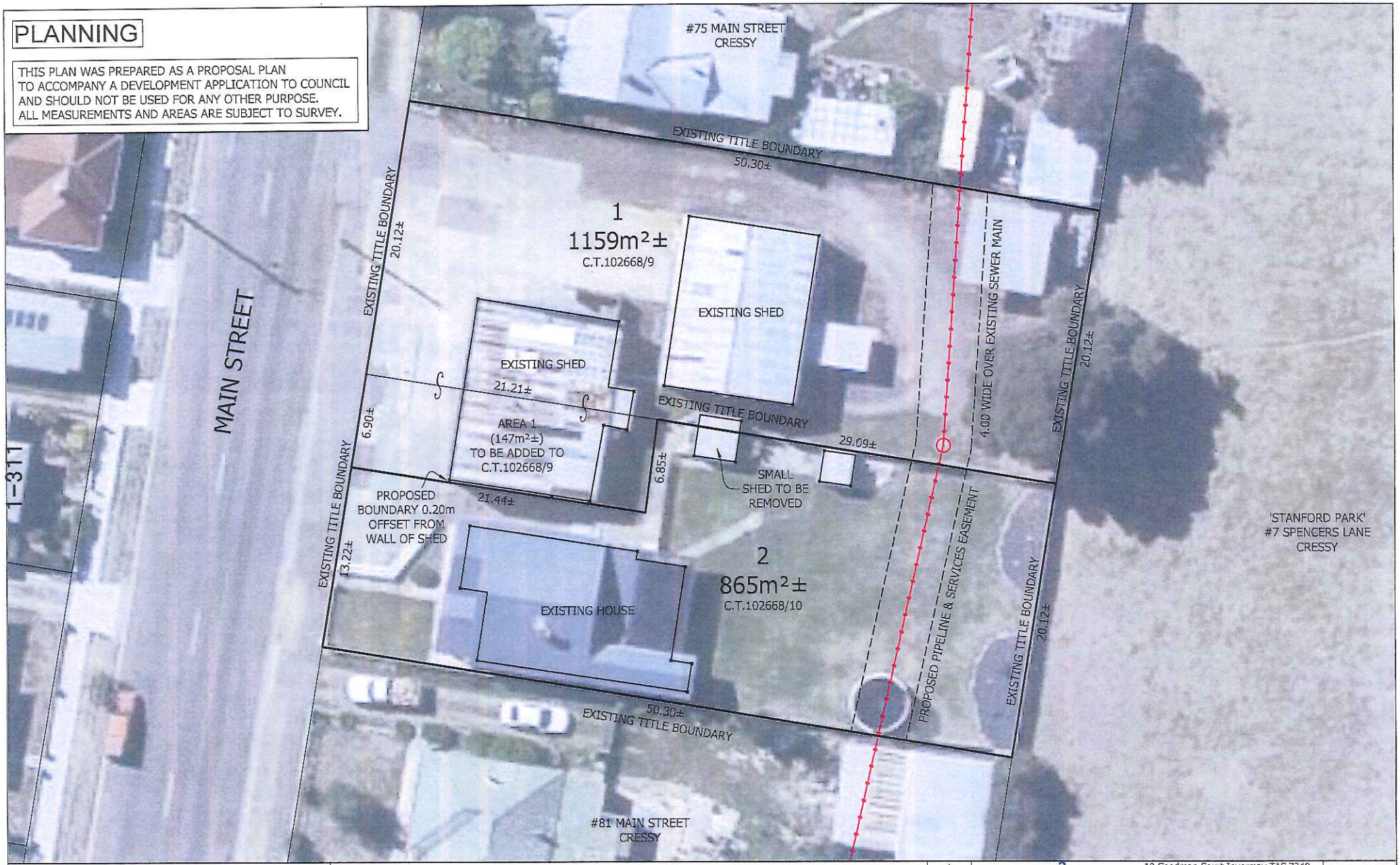


EXHIBIT E

PLANNING

THIS PLAN WAS PREPARED AS A PROPOSAL PLAN
TO ACCOMPANY A DEVELOPMENT APPLICATION TO COUNCIL
AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE.
ALL MEASUREMENTS AND AREAS ARE SUBJECT TO SURVEY.



Notes:
1. All measurements and areas are subject to survey.
2. Boundaries are compiled only from D.102668 and are approximate and subject to survey.
3. Positions of existing buildings have been digitised from aerial photography per LISTmap.

PROPOSED 2 LOT SUBDIVISION
OWNER: LEONARD JOHN WILLIAMS & HELEN FAYE WILLIAMS
77-79 MAIN STREET, CRESSY 7302
C.T.102668/9 & C.T.102668/10

N

WOOLCOTT SURVEYS
10 Goodman Court Invermay TAS 7248
PO Box 593 Mowbray Heights TAS 7248
Phone (03) 6332 3760
Fax (03) 6332 3764
Email: admin@woolcottsurveys.com.au

Job Number L200510

Drawn	File name	Date	Scale	Edition	Sheet
ABB	L200510_Proposal_Plan_200720	21/07/20	1:250@A3	v1.0	1/1

Proposed Dwelling Extension & Rumpus

77-79 Main St Cressy Tas 7302

Client: Carlton Dixon

Apogee Design
A | Level 2, 126 Charles St
| Launceston | Tas 7250
P | PO Box 7668
| Launceston | Tas 7250
E | info@apogeedesign.com.au
ABN | 40 624 215 041

General Notes:

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Project details

Council	Northern Midlands Council	
Zone	20.0 Local Business	
Planning Overlay	101.URB 101.FRE	
PID	6749768	
Title Filo	102668	
Title Volume	9	
Building Classification	3	
Climate Zone	7	
Design Wind Speed	-	Site classification to AS 4055-2012. Reference report author
Soil Class	-	Site classification to AS 2870-2011. Reference report author.
BAL Rating	-	Site classification to AS 3959-2009. Reference report author.
Energy Rating	-	Reference report author.
Corrosive Environment	-	Steel subject to the influence of salt water, breaking surf or heavy industrial areas, refer to BCA section 3.4.2.3 & BCA Table 3.4.4.2 <300m AHD (BCA Figure 3.7.5.2)
Alpine	-	
Other	-	

Area Schedule

Name	Area m²
Site Area	1011.83m²
Existing Shed Building Area	118.49m²
Existing Garage Building Area	144.90m²

Architectural

A01	Location Plan
A02	Ex. Site Plan
A03	A03 Plan: Site
A04	Plan: Existing - Shed
A05	Plan: Existing - Garage
A06	Plan: Rumpus Room
A07	Plan: Dwelling
A08	Elevation: North & East
A09	Elevation: South & West

1 | Plan: Location
- | 1:1000

Stage	Rev	Description	Date
Sk	01	Issued for Client review and comment	8/07/2020

Project Name
Proposed Dwelling Extension & Rumpus

Project No.	**77-79 Main St Cressy, Tas 7302**
Project Address	**2026**
Client	**Carlton Dixon**
Property ID	6749768
Title Reference	102668/9
Designer	--
License No.	CC----
Drawn	--
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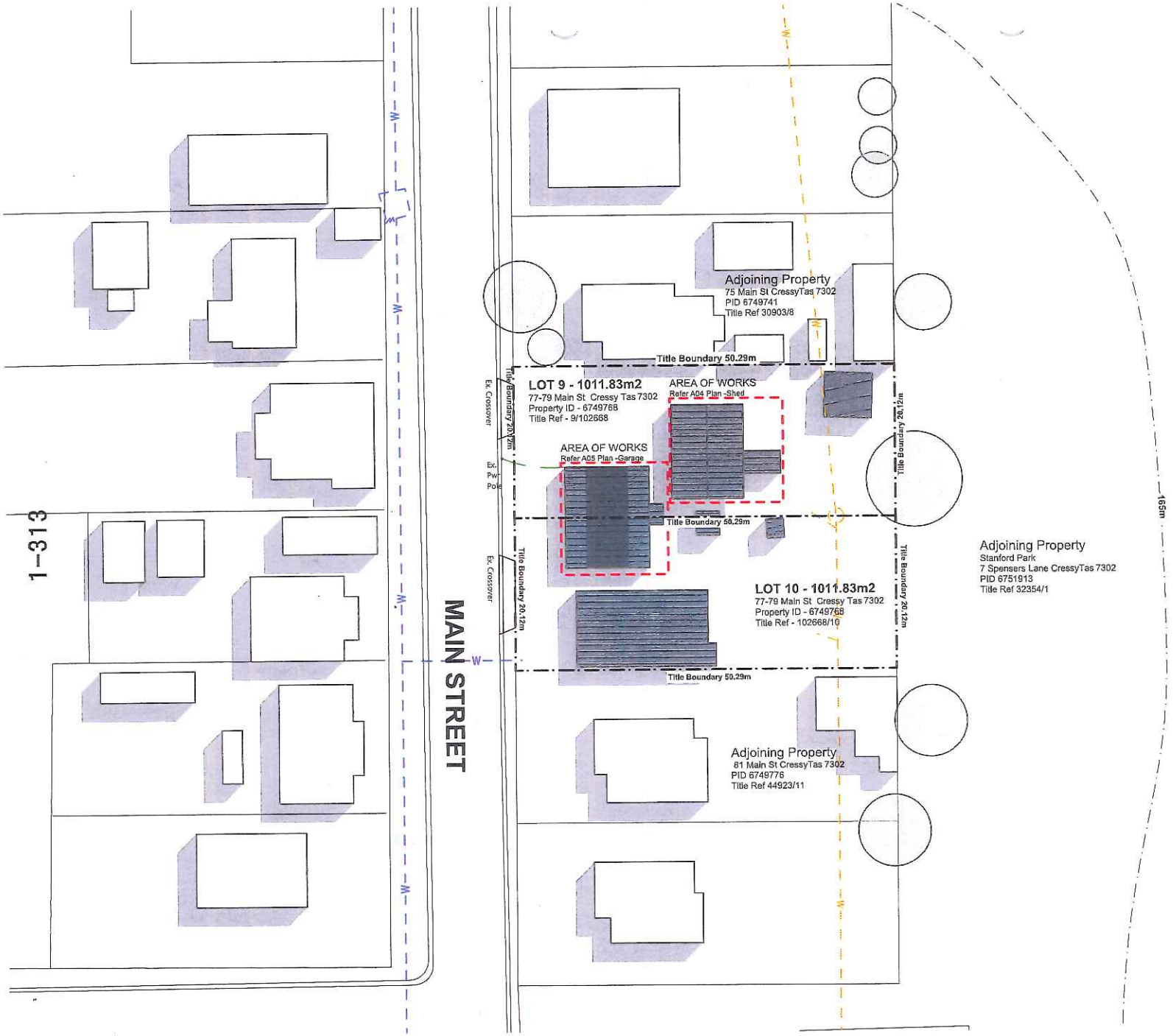
Location Plan

Status	SK
Print date	Thursday, 9 July 2020
Original size	A3
Drawing N°/Stage/Revision	

A01-Sk01



1 | Plan: Existing Site
- | 1:500

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Legend Notes

±0.000 Existing levels

±0.000 New levels. RL Reduced Level

Boundary & Building Location

The Boundary is Approx only.
A Land Surveyor is to be engaged prior to construction to accurately locate Site boundary and Fencing.

Stage	Rev	Description	Date
Sk	01	Issued for Client review and comment	8/07/2020

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License No.	CC---
Drawn	--
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Ex. Site Plan

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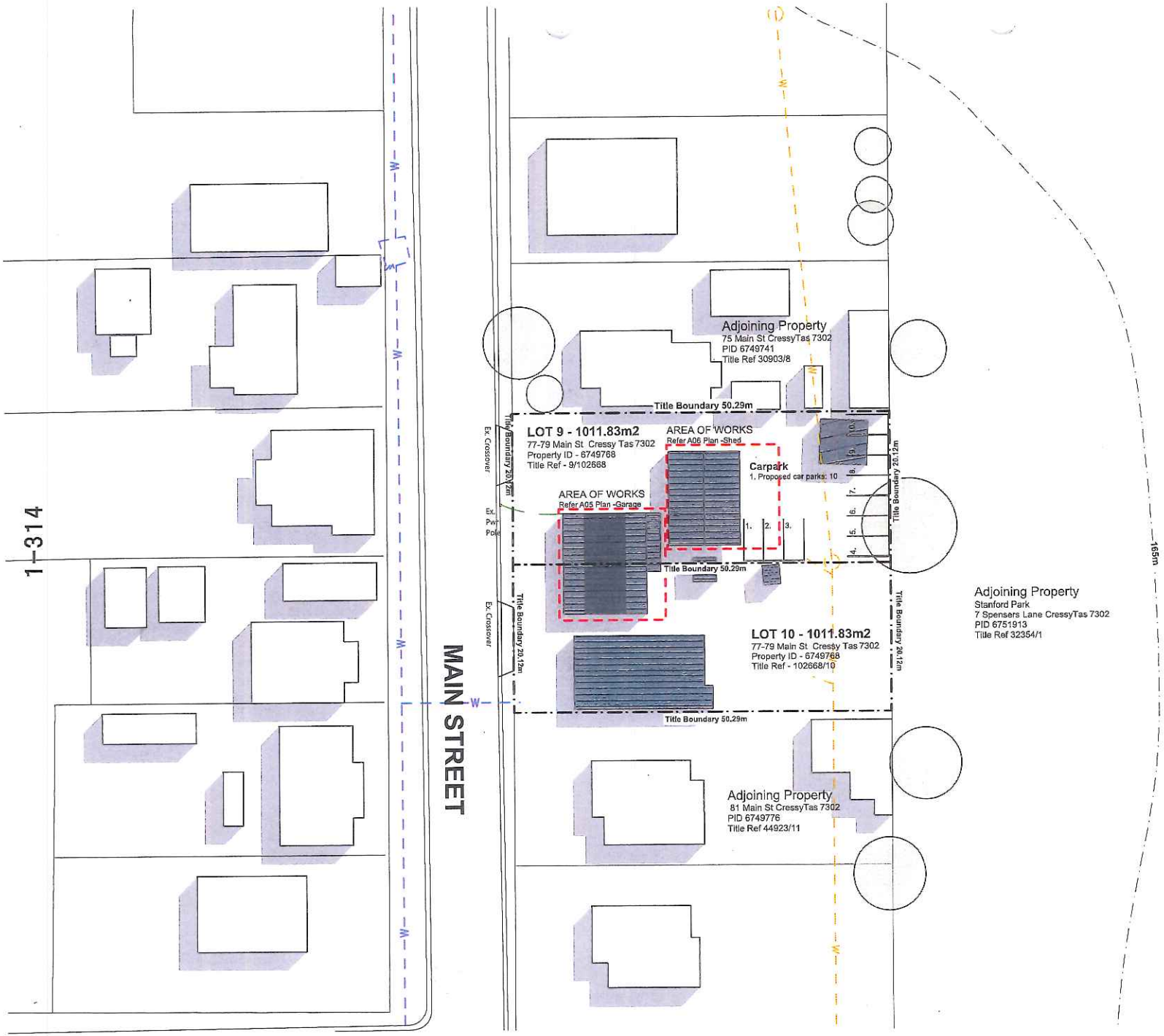
Print date	Thursday, 9 July 2020
Original size	A3
Drawing N°/Stage/Revision	

A02-Sk01



1 - Plan: Site 1:500

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Client	**Carlton Dixon**
Property ID	6749768
Title Reference	102668/9
Designer	--
License No.	CC---
Drawn	---
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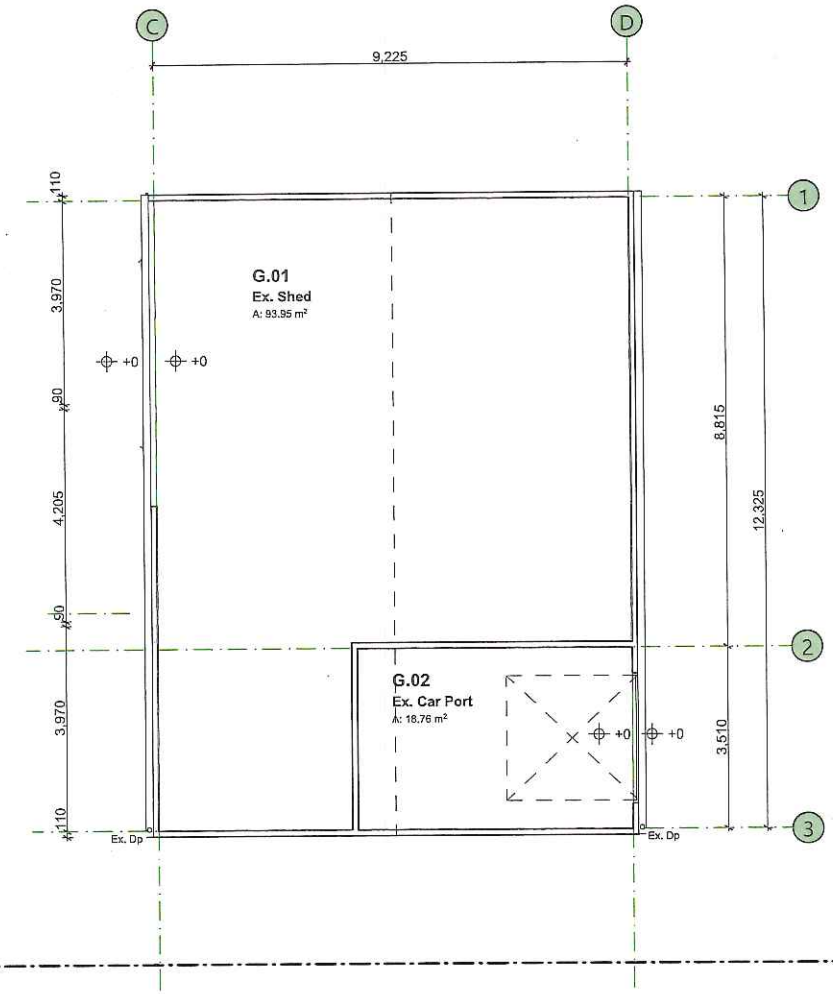
A03 Plan: Site

Status	SK
Print date	Thursday, 9 July 2020
Original size	A3
Drawing N°/Stage/Revision	

A03-Sk01



1–315

1 | Plan: Existing - Shed
- | 1:100

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Floor Plan Legend
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+0	Existing levels
+0	New levels. RL Reduced Level
G.01 Room Name	Zone: Building Level.Room number & Room Name
B	Grid Line
DG.01	Door tag: Door Building Level.Door Number. Refer to door schedule for details.
W1.01	Window tag. Window Building Level.Window number.Refer to door schedule for details.
WT.01	Wall Type Tag. Refer to details.
DP	Downpipe
	Existing walls, thickness and composition varies. Confirm on site.

Stage	Rev	Description	Date
Sk	01	Issued for Client review and comment	8/07/2020

Project Name
Proposed Dwelling Extension & Rumpus

Project No.	**77-79 Main St**
	Cressy, Tas 7302
Project Address	**2026**
Client	**Carlton Dixon**
Property ID	6749768
Title Reference	102668/9
Designer	--
License No.	CC—
Drawn	—
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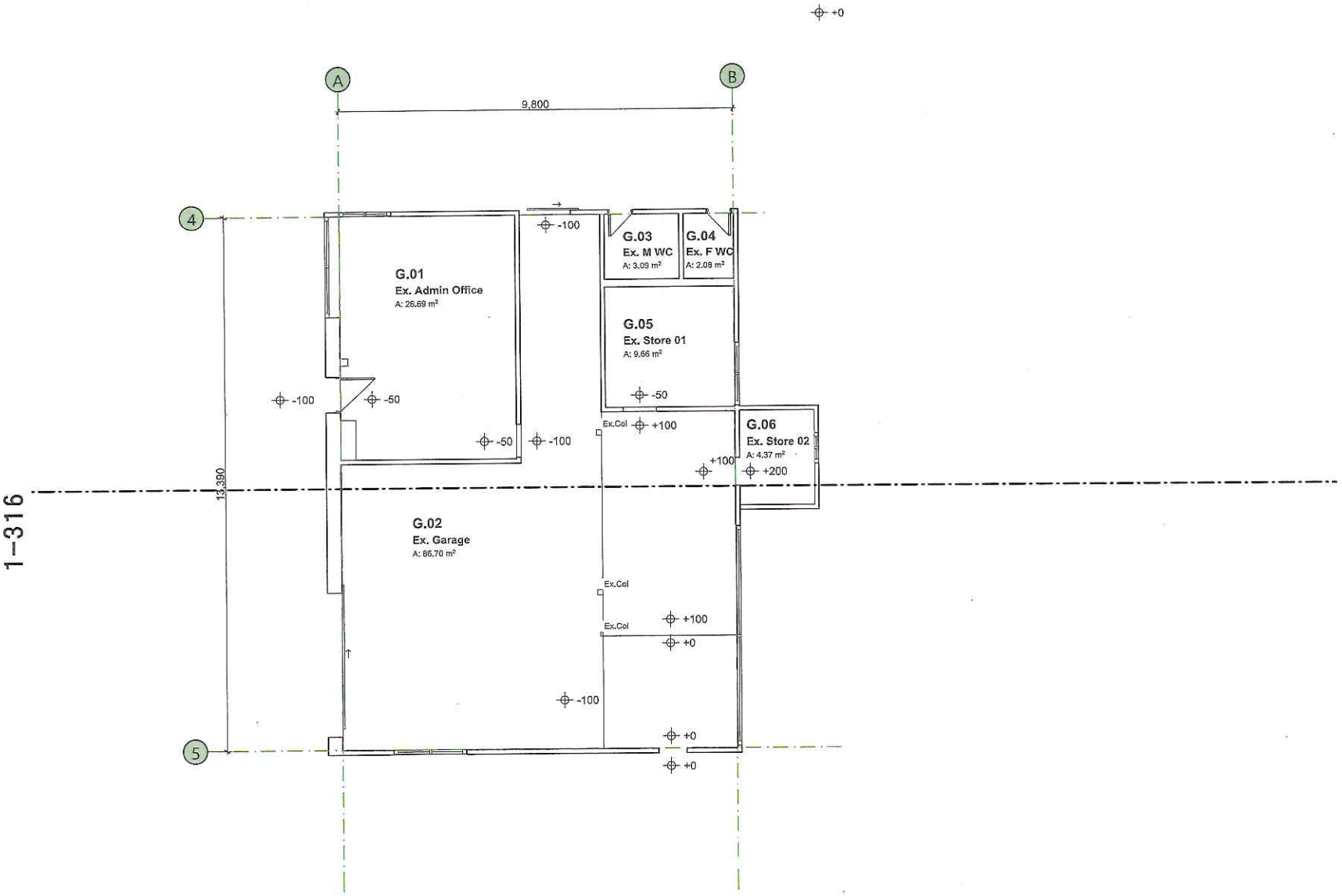
Plan: Existing - Shed

Status	SK
Print date	Thursday, 9 July 2020
Original size	A3
Drawing N°/Stage/Revision	

A04-Sk01



1 | Plan: Existing - Garage
- | 1:100

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Stage	Rev	Description	Date
Sk	01	Issued for Client review and comment	8/07/2020

Project Name
Proposed Dwelling Extension & Rumpus

Project No.	**77-79 Main St Cressy, Tas 7302**
Project Address	**2025**
Client	**Carlton Dixon**
Property ID	6749768
Title Reference	102668/9
Designer	--
License No.	CC---
Drawn	--
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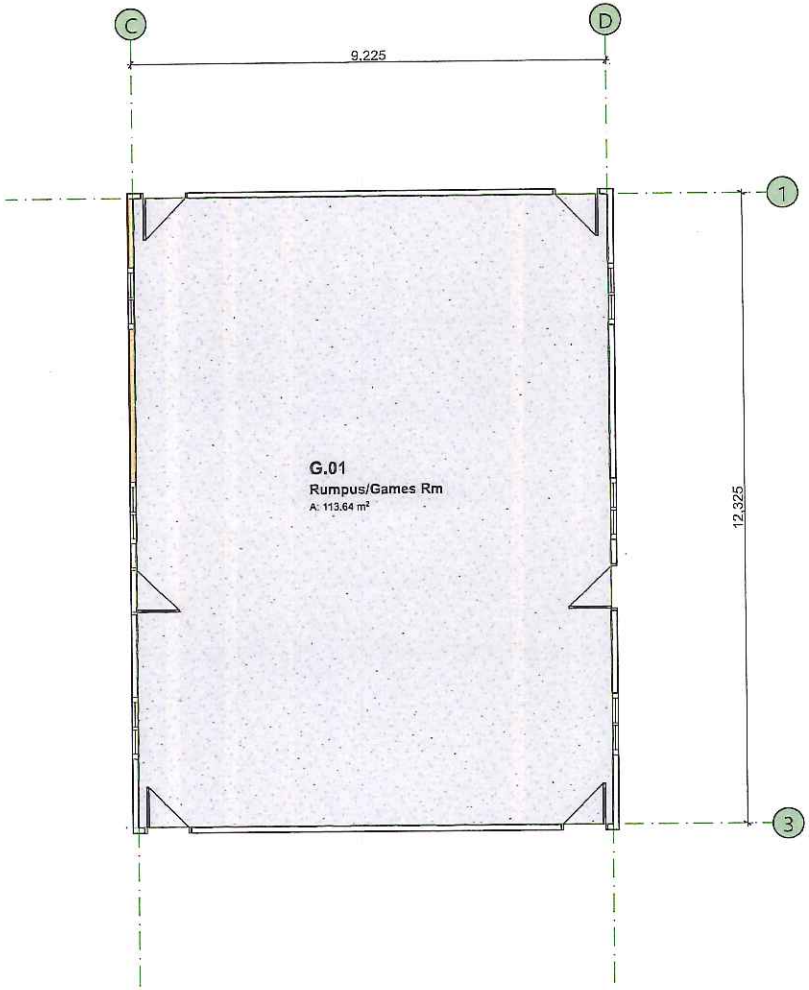
Plan: Existing - Garage

Status	SK
Print date	Thursday, 9 July 2020
Original size	A3
Drawing Nº/Stage/Revision	

A05-Sk01



1-317

1 | Plan: Ground Floor Furniture
- | 1:100

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Sk	01	Issued for Client review and comment	8/07/2020

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Designer	--
License No.	CC---
Drawn	--
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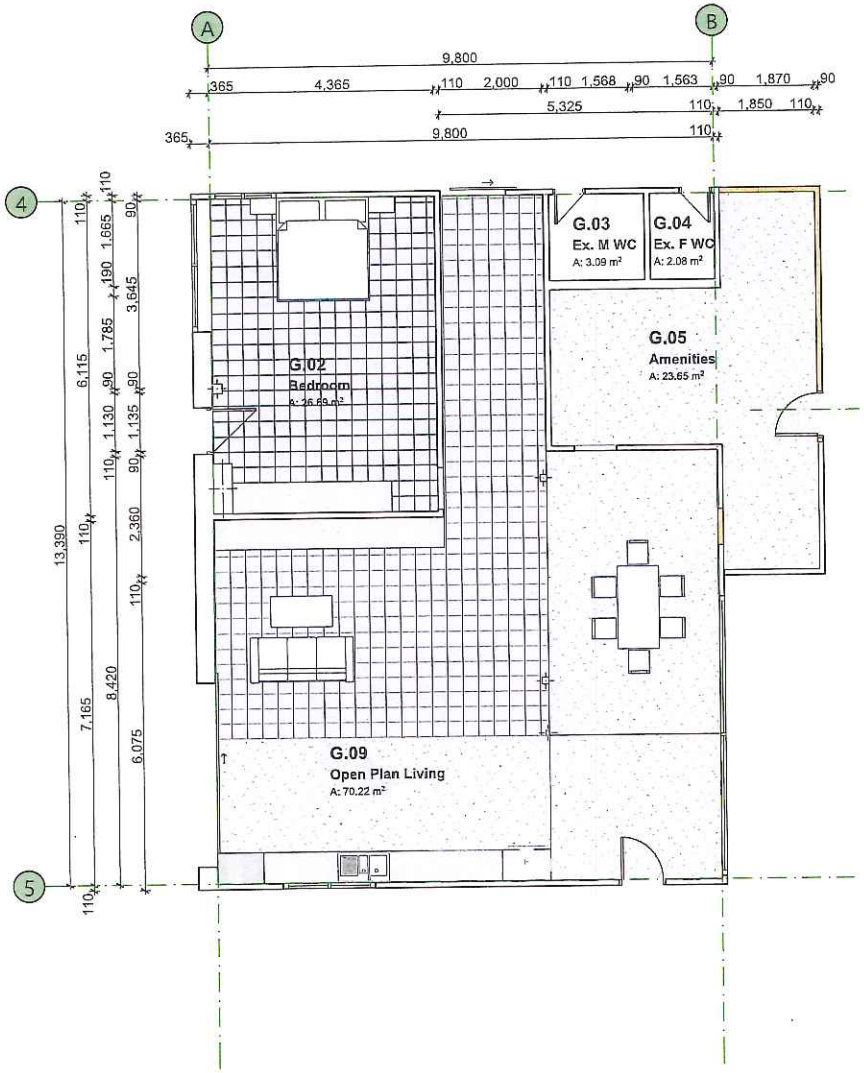
Plan: Rumpus Room

Status	SK
Print date	Thursday, 9 July 2020
Original size	A3
Drawing N°/Stage/Revision	

A06-Sk01



1–318

1 | Plan: Dwelling
- | 1:100

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Drawn	--
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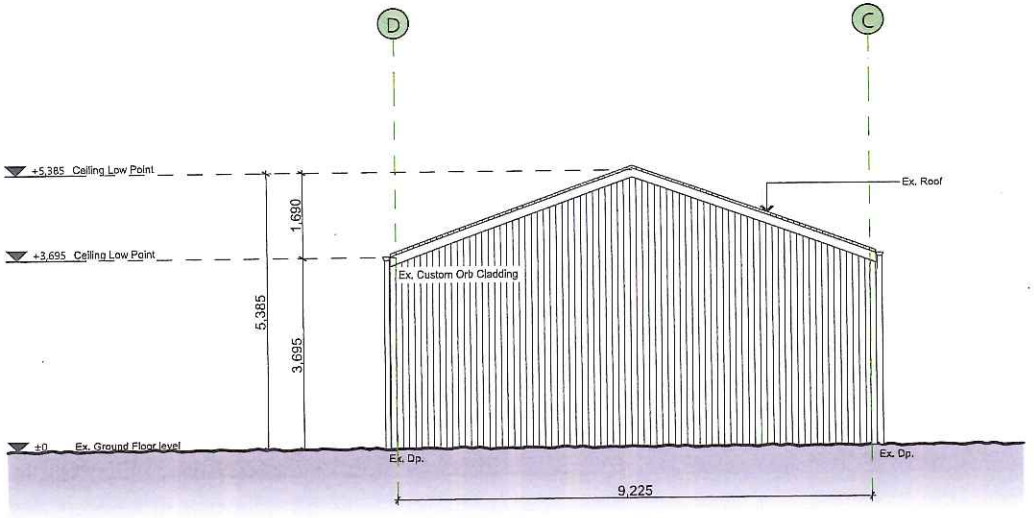
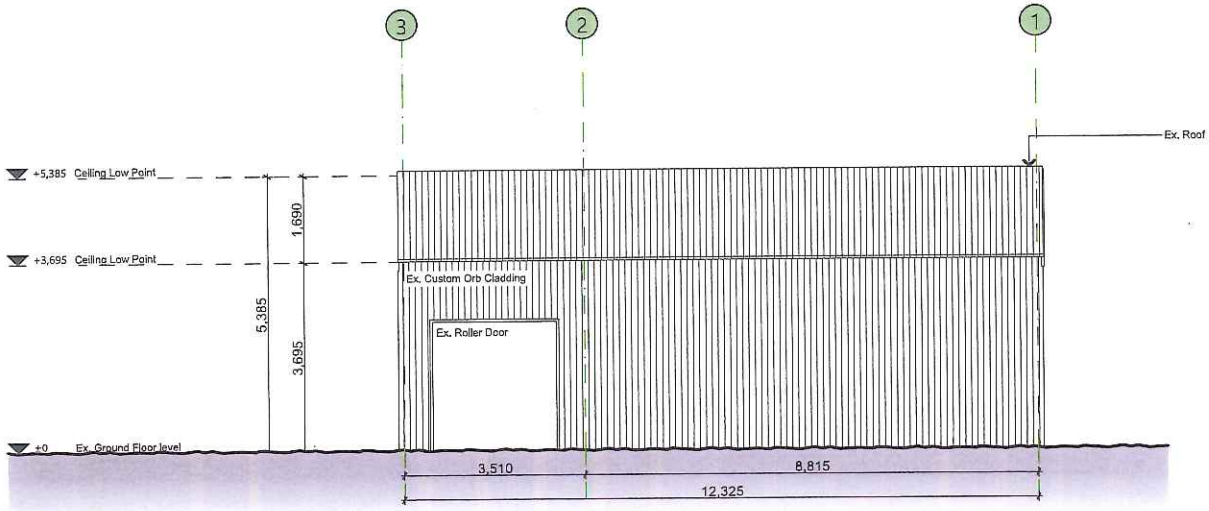
Plan: Dwelling

Status	SK
Print date	Thursday, 9 July 2020
Original size	A3
Drawing N°/Stage/Revision	

A07-Sk01



1 | Elevation: North
- | 1:100



2 | Elevation: East
- | 1:100

1-319

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Elevation Legend

A.	Awning window
CJ.	Control joint
CL.	Ceiling level
DP.	Downpipe
F	Fixed window
FL.	Floor level
Pb.	Plasterboard
S.	Sliding window
SD.	Sliding door

Stage	Rev	Description	Date
Sk	01	Issued for Client review and comment	8/07/2020

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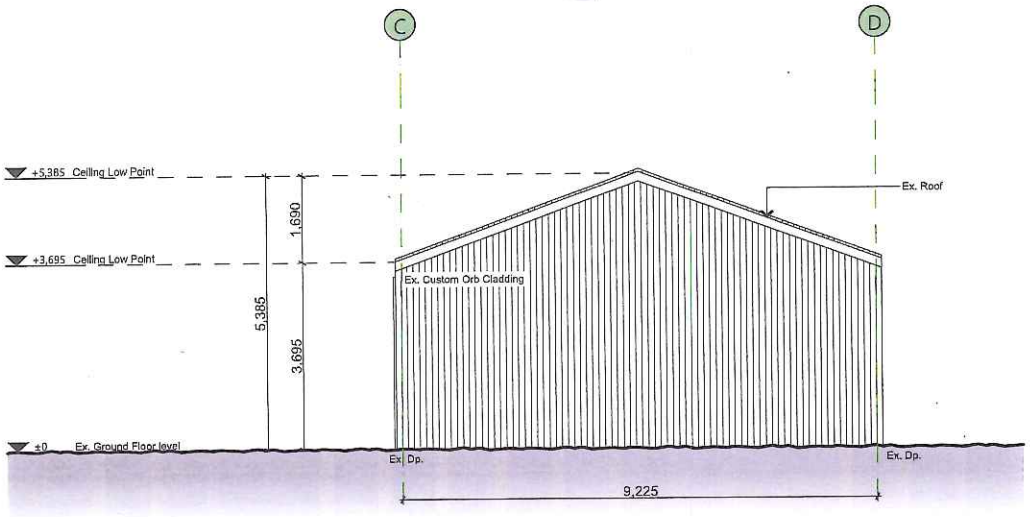
License No.	CC----
Drawn	--
e-file	C:\Users\Apogee-04\Dropbox (Apogee (TAS) Pty Ltd)\Apogee team folder\01_projects\2026_77 Main St_Cressy\02_Sketch Design_Dixon\ - Arch\CAD\2026_77 Main St Cressy.pln

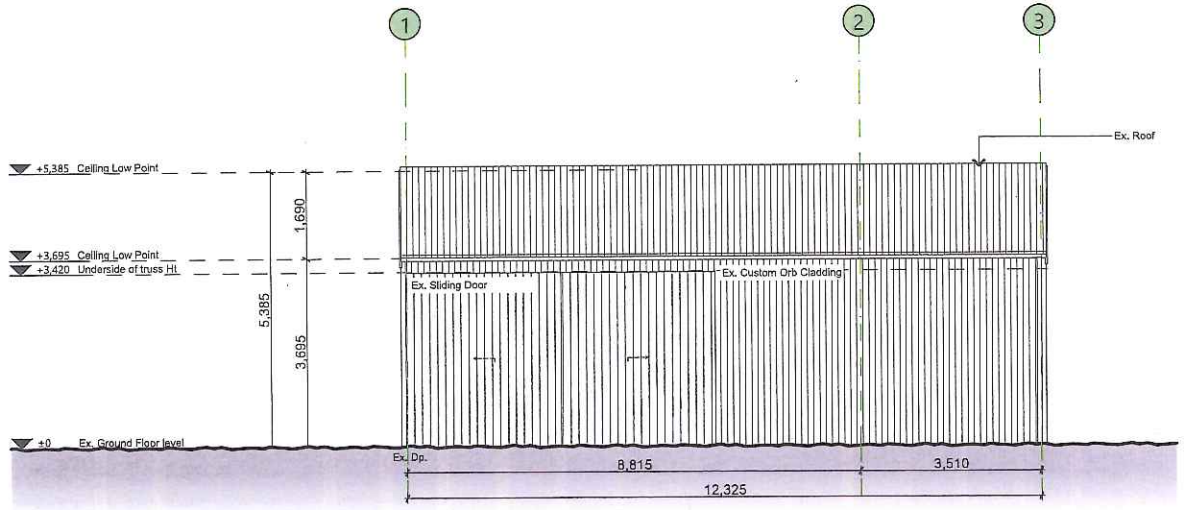
Elevation: North & East

Status	SK
Print date	Thursday, 9 July 2020
Original size	A3
Drawing N°/Stage/Revision	

A08-Sk01



1 | Elevation: South
- | 1:100



2 | Elevation: West
- | 1:100

1–320

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CL.	Ceiling level
DP.	Downpipe
F	Fixed window
FL.	Floor level
Pb.	Plasterboard
S.	Sliding window
SD.	Sliding door

Stage	Rev	Description	Date
Sk	01	Issued for Client review and comment	8/07/2020

Project Name
Proposed Dwelling Extension & Rumpus

Project No.	**77-79 Main St**
	Cressy, Tas 7302
Project Address	**2026**
Client	**Carlton Dixon**
Property ID	6749768
Title Reference	102668/9
Designer	--
License No.	CC---
Drawn	--
e-file	C:\Users\Apogee-04\Dropbox (Apogee (TAS) Pty Ltd)\Apogee team folder\01_projects\2026_77 Main St_Cressy\02_Sketch Design_DA\cad - Arch\CAD\2026_77 Main St Cressy.pln

Elevation: South & West

Status	SK
Print date	Thursday, 9 July 2020
Original size	A3
Drawing N°/Stage/Revision	

A09-Sk01

Detailed Site Investigation

77 Main St, Cressy

Project No: 7186

Date: October 2020

es&d
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Document Control

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Version:	Final
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Prepared For:	Butler McIntyre Investments Ltd

Version:			Date:
DRAFT 1	A Pascoe	ES&D	29/05/2020
FINAL	R Cooper	ES&D	31/10/2020

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List of Figures

Executive Summary

Environmental Service and Design (ES&D) were commissioned by their client Butler McIntyre Investments Ltd to prepare a detailed Site assessment to meet the planning requirements of the Northern Midlands Interim Planning Scheme 2013.

E2.5 Use Standards E2.5.1 Use of Potentially Contaminated Land and E2.6 Development Standards E2.6.1 Development of Potentially Contaminated Land.

Use of potentially contaminated land must demonstrate that human health and safety and the environment are not at risk as a result of the use through:

a) a site investigation report by a person who meets the competencies established under Schedule B (10) of the National Environment Protection (Assessment of Site Contamination) Measure 1999; and

b) where the site investigation report indicates the presence of contaminants that require management

   i) contaminant management plan; and

   ii) remediation action plan; by a person who meets the competencies established under Schedule B (10) of the National Environment Protection (Assessment of Site Contamination) Measure 1999; and

c) completion of the decontamination process prior to the commencement of the use.

The attached UPSS Decommissioning Report shows the decontamination process of a former service station located at 77-79 Main Road Cressy. The results were compared with NEPM guidelines and found the level of risk to be acceptable for Residential Development. The report shows that the planning requirements have been met.

This report reviews the remainder of the site and surrounds. A full site history and NEPM Based Risk Assessment confirms (with the results of the vapour assessment) that the site is suitable for the proposed residential development. No management measures are required, but if new slabs are part of future developments a PSI will be required.

1 Introduction

ES&D were commissioned by their client Butler McIntyre Investments Ltd to prepare a Detailed Site Investigation (DSI) for the disused service station located at 77-79 Main St Cressy ("the site").

This DSI was prepared to show that the UPSS removal meets the planning requirements of residential use and development of the site as a residential facility. The abandoned UPSS system was removed and remediated to acceptable risk levels, approval was obtained from EPA via the Contaminated Sites Unit in accordance with EPA Tasmania – Technical Guideline – Underground Petroleum Storage Systems: Decommissioning assessment report requirements 2014 ("UPSS 1")

Work was conducted in accordance with the requirements of the Regulations, detailed in the EPA Tasmania – Technical Guideline – Underground Petroleum Storage Systems Decommissioning Assessment – Sampling and Risk Assessment Requirements 2014 ("UPSS 2").

This report presents information on site history and environment, as well as soil and soil vapour sampling results, with results compared to NEPM (National Environment Protection (Assessment of Site Contamination Amendment 2013) guidelines. Soil was sampled to determine the extent of soil contamination after UPSS removal, and the vapour was sampled to determine the risk to occupants of the existing building slabs.

Analytical results of the UPSS Assessment are summarised as follows:

- Human health screening levels were not exceeded in soil samples taken in the UPSS tank pit or beneath associated infrastructure or excavated soil;
- Ecological screening/investigation levels were not exceeded in soil samples taken in the UPSS tank pit or beneath associated infrastructure or excavated soil;

The investigation found that there is acceptable risk to future residential users from soil surrounding the UPSS and to the freshwater ecosystem because of the UPSS. No management measures or ongoing monitoring is required for the site, and no UPSS components remain on the site. The UPSS Decommissioning report is included in Appendix 3

1.1 Objectives of the UPSS investigation

The objective of the investigation was to determine if the risk from hydrocarbons that had dispersed to the environment from the UPSS is acceptable for the residential use or development of the site. If the detected contamination poses an unacceptable risk to receptors identified in the Conceptual Site Model (CSM), further investigation is required.

1.2 Scope of works UPSS investigation

Works were carried out by ES&D and Gavandy Contracting and included:

- UPSS decommission (Gavandy)
- Collection, preparation and dispatch of soil and pit water samples for laboratory analysis (ES&D)
- Installation and testing of vapour pins installed in the slabs of the onsite buildings.(ES&D)
- Collation and interpretation of analytical results (ES&D)
- Human health and ecological risk assessments (ES&D)
- Preparation of the assessment report (ES&D).

2 Site Identification and Ownership Information

Site identification and current ownership information is summarised in Table 1.

Table 1 - Site Details

Property ID	6749768
Title Reference	102668/9 and 102668/10
UPSS Address	77-79 Main St, Cressy TAS 7302
UPSS infrastructure owner	Leonard John Williams and Helen Faye Williams
Landowner	Leonard John Williams and Helen Faye Williams
Site area (m^2)	~2016

A site plan is given in Figure 1.

Figure 1: Site Plan

3 Land Use Information

3.1 Current and Proposed Land Use

The site is a former petrol station which contains a garage, shed and single storey dwelling. The proposed development has not been confirmed but will involve the demolition of the garage and construction of residential units.

3.2 Zoning

The site is located on the main street of Cressy and zoned local business under the Northern Midlands Interim Planning Scheme 2013. This will require changing to residential zoning if the proposed development goes ahead. Figure 2 shows zoning of surrounding properties.

	Local business		Open space		Particular purpose		Rural resource
	Residential		Utilities		Low density residential		Community purpose

Figure 2: Zoning

3.3 Surrounding Land Use

Residential properties are directly to the north and south of the site, and over the road to the west. To the east is rural land. A small park, a church and cemetery and a school are located to the southwest, see figure 2. Offsite contamination is minimal.

3.4 Utilities

A Taswater sewer main runs underneath the east of the property, and the water main reaches the site on the southwest, see Figure 3. Dial Before You Dig was consulted by Gavandy Contracting before excavation.

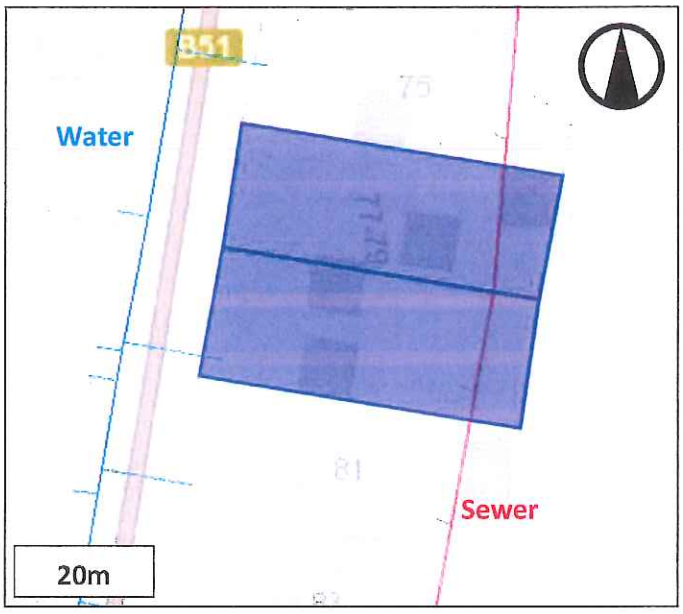

Figure 3: Utilities

4 Site History

There is little information available on the history of the site. The garage appears to have been built between approx. 1945 and 1960 based on the overall style, steel windows and brickwork. The dwelling is earlier and of a Californian bungalow style which was popular from approx. 1920 until WW2.

5 Geology, Hydrology and Hydrogeology

5.1 Topography

According to Google Earth, the site slopes very gently to the west, with contours between 168m AHD, dropping to 167m on the western side.

5.2 Surface Water

The closest surface water to the site is an irrigation channel 360 meters to the west. This channel runs through paddocks on Murfettville Farm (the land bordered by Murfet St and Saundridge Rd) and connects with three dams on Murfettville; including two larger dams 800m northwest, and a small dam 700m west of the site.

There are several drains and small streams to the east of the site, the closest being 390m southeast, which run in an easterly direction towards the Macquarie River 1.5 km away. These distances are beyond a distance reasonable to expect impact would occur.

5.3 Geology

According to TheLIST, the site is underlain by poorly consolidated clay, silt and sand of Cretaceous age.

5.4 Hydrogeology

There is a local topographic high to the west of the site, indicating groundwater at the site is likely to flow west towards Murfettville. Figure 4 shows inferred regional groundwater flow based on contours, and Figure 5 shows groundwater flow on a local scale, confirmed by a hydrogeologist.

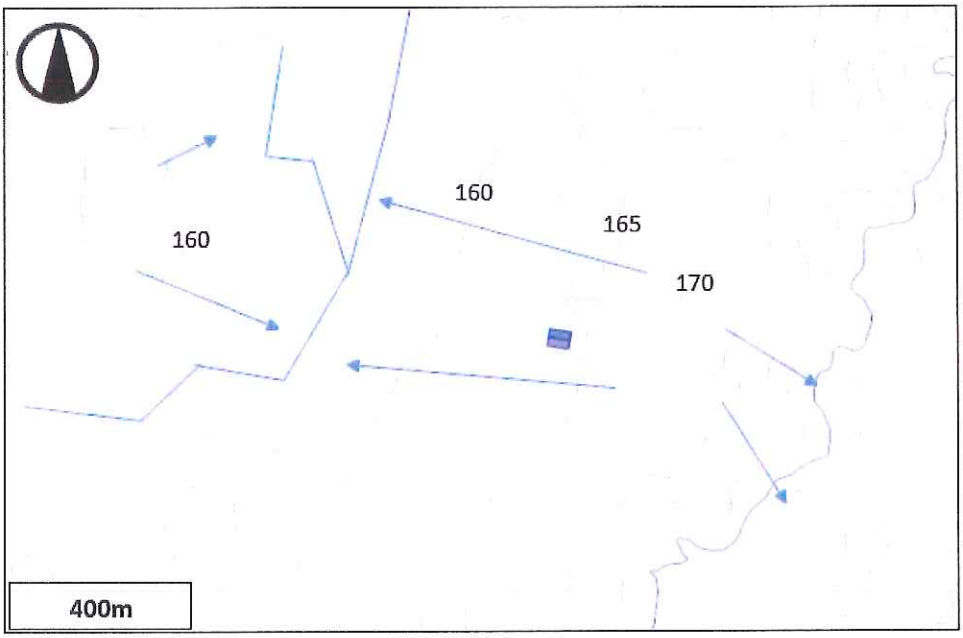

Figure 4: Inferred Regional Groundwater Flow

Blue arrows indicated inferred groundwater flow direction, blue lines show drainage channels

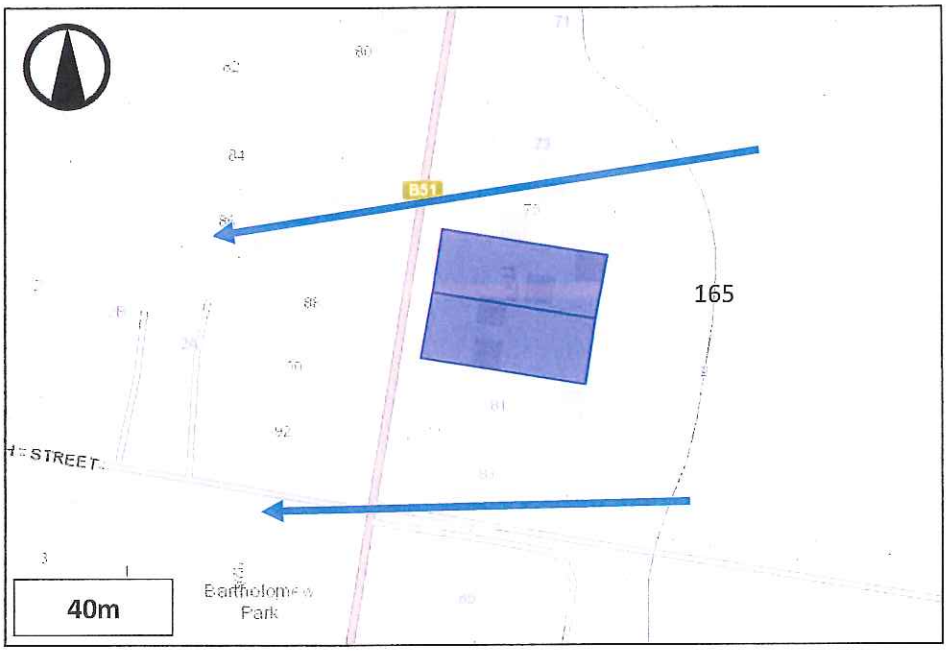

Figure 5: Inferred Local Groundwater Flow

Blue arrows indicated inferred groundwater flow direction

5.5 Acid Sulfate Soils

Acid sulfate soils (ASS) are soils which contain naturally occurring sulfides. If left undisturbed and waterlogged they are harmless, however, exposure to air can cause oxidation which allows subsequent rain events to produce sulfuric acid. A review of TheLIST confirms that the rock units underlying the site at their elevation have not been mapped as containing ASS, therefore no ASS precautions need to be taken.

5.6 Flora and Fauna

According to TheLIST, the urban area of Cressy surrounding Main St, including the site, is mapped as 'urban areas' (FUR) under the Tasmanian Vegetation Community mapping scheme TASVEG 3.0. The only other classification within 1km of the site is 'agricultural land' (FAG). Neither of these vegetation communities are listed as threatened under the *Tasmanian Nature Conservation Act 2002*. FUR and FAG are not suitable habitats for native wildlife, although may be accessed while in transit to other sites or while scavenging.

Threatened flora and fauna records do not exist for the site, but do exist for locations within 500m. The slender waterpepper (Persicaria decipiens), Wedge-tailed eagle (Aquila audax), eastern quoll (Dasyurus viverrinus) and Tasmanian devil (Sarcophilus harrisii) have been sited within 500m of the site. These species are unlikely to use the site as the grassed area to the rear of the house is fenced. Also, there are easier routes for wildlife to access Macquarie River and surrounding farmland from Main St, such as Spencers Ln or Church St.

5.7 European and Aboriginal Heritage

The site is not listed on the Australian heritage database and is not located within 500m of a heritage property. The site is not listed as a site at risk of impacting Aboriginal relics according to the Aboriginal Heritage property search (record PS0114003).

The site is not located in or within 500m of World Heritage or National Heritage locations, protected wetlands or marine parks, or key ecological features according to the EPBC Act. The site is not listed as a protected site under this Act.

6 UPSS Information

The UPSS consisted of two tanks in a single pit divided by a clay wall, located in the northwest corner of the site, see Figure 1 for pit location and Table 2 for details. Bowsers and lines were not located. There are three additional tanks nearby on Council land which were decommissioned pre 2011. Residual concentrations of petroleum hydrocarbons remain in soils near the location of the former bowsers and fuel lines. Refer to the UPSS Decommissioning Report (ES&D, September 2020)

Table 2: UPSS Removed in May 2020

Tank	*Installed*	*Contents*	*Capacity (L)*	*Construction*
1	Unknown	ULP	5,000	6mL steel
2	Unknown	ULP	10,000	8-10mL steel

Figure 6 shows the layout of the tank pit.

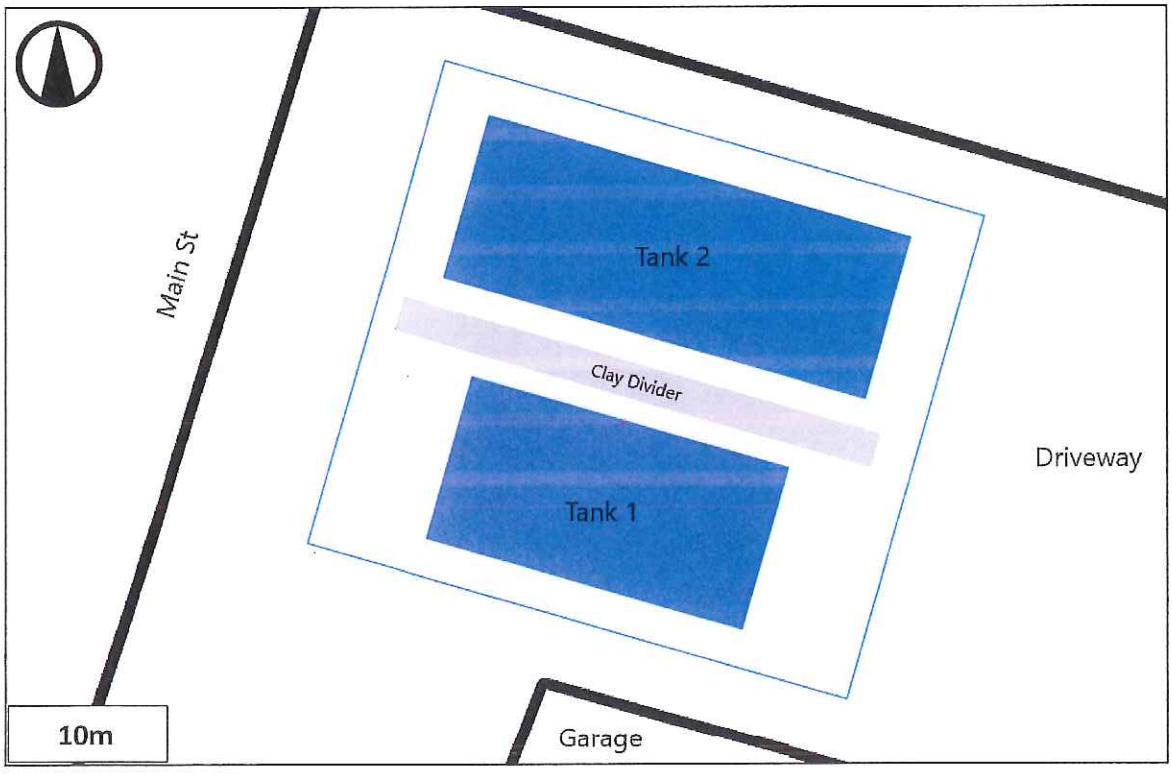

Figure 6: UPSS Detail

The UPSS report covers the remediation of the area and impacts of the UPSS.

7 Potential Receptors

The past use of the site as a service station may have contaminated the groundwater and surrounding soil. Contaminants of potential concern (COPC) include hydrocarbons and heavy metals, such as those used in fuel and oil additives.

7.1 Human Receptors

Human receptors to potential contaminants include the current and future site residents, residents and users of neighbouring properties, residents and users of properties located downgradient, and any workers who will have contact with the soil and/or groundwater, such as those involved with excavation. The latter includes any future work occurring on the site. It may also include people involved with irrigation at Murfettville, although contamination would have to be extensive to appear in the irrigation channels in quantities high enough to cause harm. EPA have also requested feedback on potential impacts to drinking water infrastructure.

7.2 Ecological Receptors

Ecological receptors include transient wildlife and stock using the irrigation channels at Murfettville, although it was not noted whether the paddocks were used for cropping or stock. Transient wildlife are unlikely to be affected by any contamination due to the majority of the pit area being covered by concrete. There is a small strip of grass along the northern property boundary and therefore it is still a possibility.

8 Preliminary Conceptual Site Model

A preliminary Conceptual Site Model (CSM, Table 4) was developed after consideration of risks to potential human and ecological receptors as outlined in Section 7.

Table 3 - Preliminary Conceptual Site Model

Contamination Source	COPC	Pathway	Receptor
Underground petroleum storage systems (UPSS)	• Heavy metals • Aliphatic hydrocarbons • Aromatic hydrocarbons	Vapour inhalation of COPC in surface soils	• Site users • Subsurface workers • Surrounding site users
	• Heavy metals • Aliphatic hydrocarbons • Aromatic hydrocarbons	Dermal contact/ingestion of COPC in surface soils	• Site users • Subsurface workers • Surrounding site users • Transitory wildlife
	• Heavy metals • Aliphatic hydrocarbons • Aromatic hydrocarbons	Migration into soil and groundwater and subsequent ingestion/dermal contact or inhalation of COPC	• Site users • Subsurface workers • Surrounding site users • Transitory wildlife • Murfettville

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9 Basis for Assessment

Health Screening Levels (HSLs), Health Investigation Levels (HILs), Ecological Investigation Levels (EILs), Ecological Screening Levels (ESLs) and Groundwater Investigation Levels (GILs) provided in the *National Environmental protection (Assessment of Site Contamination) Measure* 1999, as amended April 11, 2013 (NEPM) were the designated criteria for assessing potential ecological and human health risks posed by hydrocarbon contamination of soil as applicable. NEPM guidelines for residential A were used due to the development proposal being for residential units.

Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC CARE) documents used in the assessment comprised CRC CARE Technical Report No. 10 *"Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater Part 2: Application Document"* (TR10).

With respect to the assessment for lead, the ambient soil background concentration (ABC) is not known. The ABC is normally added to the added contaminant limit (ACL) provided by NEPM to give the EIL value, however the ABC often makes little difference to the ultimate value. For the purposes of this assessment the ACL was considered to be equivalent to the EIL.

All contaminants that could be reasonably expected to disperse to the environment from a UPSS used for storing petroleum products or workshops for motor vehicles were included in the analytical plan. These comprised Total Petroleum Hydrocarbon/Total Recoverable Hydrocarbon (TPH/TRH) fractions, Benzene, Toluene, Ethylbenzene, Xylene and Naphthalene (BTEXN) and Lead (Pb).

Assessment values are included in the results tables 8 to 9.

10 Soil sampling and UPSS decommission

The soil sampling plan, UPSS decommissioning details and soil results can be found in the UPSS Decommissioning Report (ES&D, September 2020).

11 Soil Vapour Sampling

Three vapour pins were installed on the 28th of May 2020, two in the shed and one in the garage. Figure 12 shows their location. This was conducted prior to the decontamination of the soil around the fuel system.

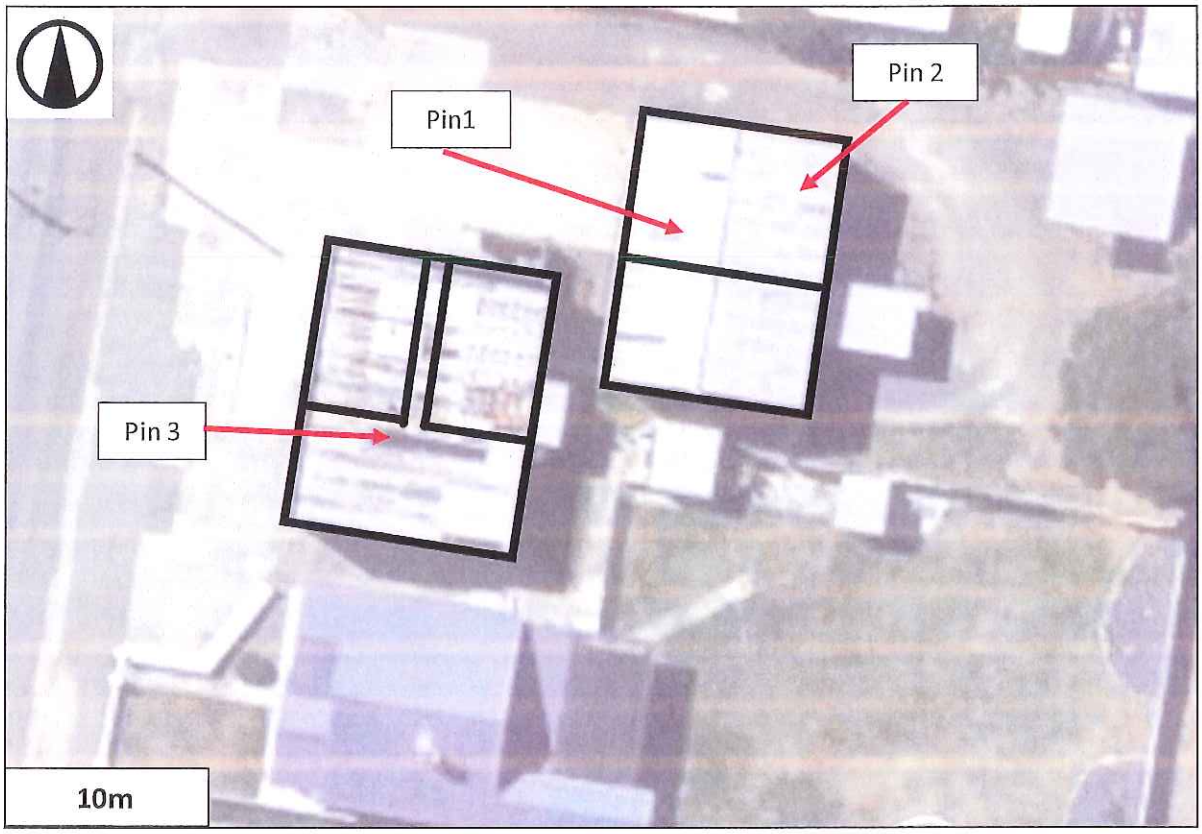

Figure 7 Vapour Pin Locations

The vapour pins were sampled on the 3rd of June 2020. The canisters were lost by Toll on the way from ALS Springvale and ALS Newcastle, where all of the canisters and soil samples were freighted. This seems to have been the result of non-contact delivery during the Covid-19 pandemic. The cylinders were eventually located, and testing occurred within the standard holding times.

Soil gas was collected via a Vapor Pin TM (vapour pin). The vapour sampling methodology was guided by CRC CARE 2012; Davis, GB, Wright, J & Patterson, BM 2009; NEPM 1999 (as amended) and AS 4482.2:1999. Standard Operating Procedures (SOPs) for vapour pin installation and sampling by Cox-Colvin & Associates Environmental Services were followed.

Laboratory certified canisters of 1.4L capacity set for a flow rate of 50mL/minute were used to collect sub-slab soil gas samples.

0 mm of rain fell on the day (BOM, 2020) of vapour sampling with 0.0mm in the preceding 24 hours; weather conditions were fine, sunny, and still. The vapour pin was flush mounted into the concrete slab within the buildings and sampling line tightness and vapour pin surface seal were tested using methods described below. Sampling details are summarised in Table 4.

Sampling was started once the initial tests on the vapour pin system had been successfully completed. 4.8mm ID Teflon tubing connected the vapour pin and primary and duplicate canisters. Canister volume sampling time was calculated based on the pre-set flow rate, and the pressure recorded before and after sampling.

A three-way valve was used to isolate the various sections of the sampling line apparatus to perform the shut-in and surface/line seal tests prior to sampling. Tubing as previously described was used for all components of the apparatus. A vacuum was applied for up to 35 seconds for the shut–in tests. To further test the seal, calibrated field PIDs were connected to the tubing. A shroud was placed over the apparatus and He gas infused into the shroud (refer Appendix F CRC CARE 2012). The He concentration in the line/train, shroud and ambient air was measured using the appropriate PID. The water dam method described in Colvin-Cox was employed to provide additional assurance. The water dam remained in place until sampling was completed. Test results show that the equipment was compliant during use. Furthermore, the laboratory certificate shows that the helium tracer gas was not detected in the primary or duplicate samples.

Purging was conducted using the apparatus supplied by ALS laboratory for the purpose. Approximately 250mL of 'dead' air was drawn from the sampling line.

Permanent gases were measured first in ambient air. The PID was subsequently connected to the sampling line to take equivalent measurements in the soil gas via the vapour pin. When gas measurement had stabilised the system was considered purged and ready for sampling.

Once sampling was complete, the canister and accessories were dispatched, together with the chain of custody document which showed sample IDs matched with canister serial numbers and the appropriate flow controller serial numbers, pre and post sampling canister gauge.

12 Results

Table 4: Soil Vapour Results

EN2004068	Pin 1	Pin 2	Pin 3	HSL-A and B
Depth (mBGSL):				0-1m
VOCs by US EPA TO15 (mg/m^3)				
Acetone	<LOR	**0.13**	<LOR	
Heptane	<LOR	**0.50**	<LOR	
Hexane	<LOR	**0.408**	<LOR	
Isooctane	<LOR	**11.4**	<LOR	
Petroleum H/Cs (mg/m^3)				
C6 – C9 Fraction	<LOR	**99.7**	<LOR	
C10 – C14 Fraction	<LOR	**69.5**	<LOR	
TRH (mg/m^3)				
C6 – C10 Fraction	<LOR	**96.5**	<LOR	
F1	<LOR	**86.3**	<LOR	180
>C10 – C16 Fraction	<LOR	**54.1**	<LOR	
F2	<LOR	**54.1**	<LOR	130
Light H/Cs (mg/m^3)				
Methane	<LOR	**700**	<LOR	
Ethane	<LOR	<LOR	<LOR	
Ethene	<LOR	<LOR	<LOR	
Propane	<LOR	<LOR	<LOR	
Butane	<LOR	<LOR	<LOR	
Toluene	<LOR	<LOR	<LOR	1300
Permanent Gases (mg/m^3)				
CO_2	61,500	**128,000**	**870**	
CO	<LOR	**13**	<LOR	
H	<LOR	<LOR	<LOR	
He	207,000	**64,200**	**271,000**	
O_2	<LOR	<LOR	<LOR	
Inert (by difference)	924,000	**1,000,000**	**907,000**	

Soil results can be found in the UPSS Decommissioning Report. Vapour results are shown in Table 4 compared to NEPM guidelines.

Table 4 notes:

- Bold indicates a value above the reporting limit, shading indicates an exceedance
- VOCs from ALS's EP101 suite which were below the reporting limit (<LOR) for all pins are omitted from Table 4
- NEPM soil vapour Health Screening Limits (HSLs) for sandy soil, low-high density residential and 0-1m depth have been chosen due to the soil type and pin length. Note that NEPM only has limits for toluene, ethylbenzene, xylenes, naphtha, benzene, and F1 and F2 fraction hydrocarbons.

12.1 Laboratory

ALS produce a QC report with each certificate of analysis. They provide a laboratory duplicate (DUP), method blank (MB), laboratory control spike (LCS) and matrix spike (MS) report. The results of these reports are shown below in Table 6.

Table 5: ALS QA/QC

ALS Report	*Date*	*DUP*	*MB*	*LCS*	*MS*
EN2004068	23/6/20	ok	ok	ok	ok

12.2 Field Data

A field duplicate was taken for vapour pin 1. RPDs are shown below, with limits calculated as per ALS laboratory rules. Table 7 shows field QA/QC to be within RPD limits.

Table 6: Field QA/QC

ALS Report	*LOR*	*Pin 1 sample*	*Dup sample*	*RPD*	*LIMIT*
Carbon Dioxide	90	61,500	61,900	1%	20%
Carbon Monoxide	6	<12	<12	N/A	N/A
Hydrogen	4	<8	<8	N/A	N/A
Oxygen	1,310	207,000	215,000	4%	20%
Helium	8	<16	<16	N/A	N/A

13 Discussion

The integrity of the sampling was found acceptable based on the layers of checking and rechecking to confirm the samples were representative of the vapour below the slab.

None of the four vapour cylinders detected contamination levels above the residential guidelines (HSL A). This is significant because even prior to cleaning up the UPSS vapour levels under the buildings to be used in the development pose risk to future users of the site.

By reviewing the UPSS Decommissioning Report it is evident that there is acceptable risk to the development from the UPSS system. The system has been removed and no soil impacts remain. Also as the process was validated, impacts on groundwater from the onsite system has not occurred. Impacts from the additional offsite tanks was confirmed by soil analysis. Any offsite impacts on groundwater will not impact on the site as confirmed groundwater flows are away from the Site.

14 Conclusions and Recommendations

The Detailed Site Investigation has concluded that the contamination risk is acceptable for the proposed development.

E2.5 Use Standards E2.5.1 Use of Potentially Contaminated Land and E2.6 Development Standards E2.6.1 Development of Potentially Contaminated Land has been met with this investigation..

The results of the soil and vapour analysis were compared with NEPM guidelines and found the level of risk to be acceptable for Residential Development. The planning requirements have been met and the development can proceed.

Rod Cooper

Principal Consultant and CEnvP

Contaminated Site Specialist

Table 7 - Revised Conceptual Site Model

Contamination Source	COPC	Pathway	Receptor
Underground petroleum storage systems (UPSS)	• Heavy metals (Lead) • Total Petroleum Hydrocarbons (TPH) • Total Recoverable Hydrocarbons (TRH) • BTEXN • PAH • Phenols	**Soil** **No contamination -Pathway removed**	• Building occupants • Subsurface workers • Surrounding site users
	• Heavy metals (Lead) • Total Petroleum Hydrocarbons (TPH) • Total Recoverable Hydrocarbons (TRH) • BTEXN • PAH • Phenols	**No contamination -Pathway removed**	• Building occupants • Subsurface workers
	• Heavy metals (Lead) • Total Petroleum Hydrocarbons (TPH) • Total Recoverable Hydrocarbons (TRH) • BTEXN • PAH • Phenols	**Groundwater** **No contamination -Pathway removed**	• Building occupants • Subsurface workers • Surrounding site users • Transitory Wildlife

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Limitations

ES&D has prepared this report in accordance with the care and thoroughness of the consulting profession for Butler McIntyre Investments Ltd. It was based on accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report. It is prepared in accordance with the scope of work and for the purpose outlined.

This report was prepared during October 2020 and is based on the conditions encountered and information reviewed at the time of preparation. ES&D disclaims the responsibility for any changes that may have occurred after this time.

This report should be read in full. No responsibility is accepted for any use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice.

Subsurface conditions can vary across a site and cannot be explicitly defined by these investigations. It is unlikely therefore that the results and estimations expressed in this report will represent the extreme conditions within the site.

The information in this report is accurate at the date of issue and is in accordance with conditions at the site at the dates sampled.

This document and the information contained herein should only be regarded as validly representing the site conditions at the time of the investigation unless otherwise explicitly stated in a preceding section of the report.

No warranty or guarantee of property conditions is given or intended.

References

CRC CARE TR10 - CRC Care Technical Report No. 10 "Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater" (September 2011)

EPA Tasmania Technical Guideline - UPSS1 - Decommissioning Report Requirements - v2 - June 2014

EPA Technical Guideline - Technical Guideline - UPSS2 - UPSS Decommissioning Assessment - Sampling and Risk Assessment Requirements - June 2014

National Environmental Protection (Assessment of Site Contamination) Measure, "Guideline on the Investigation Levels for Soil and Groundwater", Schedule B (1), 1999 (as amended 2013)

National Environmental Protection (Assessment of Site Contamination) Measure, "Guideline on Data Collection, Sample Design and Reporting", Schedule B (2), 1999 (as amended 2013)

AS 4482.1 (2005) Guide to the Sampling and Investigation of Potentially Contaminated Soil - Part 1: Non-Volatile and Semi Volatile Compounds

AS 4482.2 (1999) Guide to the Sampling and Investigation of Potentially Contaminated Soil – *Part 2: Volatile Substances*

AS 5667.1:1998, Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples

ALS Global - www.alsglobal.com/environmental/services/north-america-environmental-services/usa/petroleum-hydrocarbons.aspx

Tasmanian Government Land Information System - http:// www.thelist.tas.gov.au

EPA Tasmania Information Bulletin No. 105 – Classification and Management of Contaminated Soil for Disposal - November 2012

Department of Primary Industries, Parks, Water and Environment (DPIPWE) Groundwater Information Access Portal: http://wrt.tas.gov.au/groundwater-info/

Appendix 1 – ALS Certificates

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EN2004068**	Page	: 1 of 10
Client	: **ENVIRONMENTAL SERVICE AND DESIGN PTY LTD**	Laboratory	: Environmental Division Newcastle
Contact	: MR ROD COOPER	Contact	: Shirley LeCornu
Address	: 80 MINNA ROAD PO BOX 651 HEYBRIDGE TASMANIA, AUSTRALIA 7316	Address	: 5/585 Maitland Road Mayfield West NSW Australia 2304
Telephone	: +61 03 6442 4037	Telephone	: +6138549 9630
Project	: 7186	Date Samples Received	: 17-Jun-2020 09:10
Order number	:	Date Analysis Commenced	: 18-Jun-2020
C-O-C number	: ----	Issue Date	: 23-Jun-2020 16:19
Sampler	: ROD COOPER		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 4		
No. of samples analysed	: 4		

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

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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. 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*
Dale Semple	Analyst	Newcastle - Organics, Mayfield West, NSW
Daniel Junek	Senior Air Analyst	Newcastle - Organics, Mayfield West, NSW
Daniel Junek	Senior Air Analyst	Newcastle, Mayfield West, NSW

General Comments

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

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

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

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

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

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

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

- EP101: ALS is unable to report results for ethanol during the COVID-19 pandemic due to elevated background levels from laboratory disinfection procedures.
- EP101, EP103: Results reported in mg/m³ are calculated from PPMV results based on a temperature of 25°C and atmospheric pressure of 101.3 kPa.
- CAN-001: Results for Pressure - As Received are measured under controlled conditions using calibrated laboratory gauges. These results are expressed as an Absolute Pressure. Equivalent gauge pressures may be calculated by subtracting the Pressure - Laboratory Atmosphere taken at the time of measurement.
- CAN-001: Results for Pressure - Gauge as Received are obtained from uncalibrated field gauges and are indicative only. These results may not precisely match calibrated gauge readings and may vary from field measurements due to changes in temperature and pressure
- EP104: Results reported in mg/m³ are calculated from Mol% results based on a temperature of 25°C and atmospheric pressure of 101.3 kPa
- EP104: Sample canisters were received at sub-ambient pressures and required dilution in the laboratory prior to analysis. LOR values have been adjusted accordingly

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Analytical Results

Sub-Matrix: SOIL GAS (Matrix: AIR)				Client sample ID	PIN1 C739_S086	PIN1 DUP C816_S086	PIN2 C5068_S182	PIN3 C1086_S228	----
				Client sampling date / time	04-Jun-2020 10:38	04-Jun-2020 10:38	04-Jun-2020 10:43	04-Jun-2020 11:21	----
Compound	CAS Number	LOR	Unit		EN2004068-001	EN2004068-002	EN2004068-003	EN2004068-004	--------
					Result	Result	Result	Result	----
EP101: VOCs by USEPA Method TO15 (Calculated Concentration)									
Freon 12	75-71-8	0.250	mg/m³		<0.250	<0.250	<0.250	<0.250	----
Chloromethane	74-87-3	0.100	mg/m³		<0.100	<0.100	<0.100	<0.100	----
Freon 114	76-14-2	0.350	mg/m³		<0.350	<0.350	<0.350	<0.350	----
Vinyl chloride	75-01-4	0.0051	mg/m³		<0.0051	<0.0051	<0.0051	<0.0051	----
Bromomethane	74-83-9	0.190	mg/m³		<0.190	<0.190	<0.190	<0.190	----
Chloroethane	75-00-3	0.130	mg/m³		<0.130	<0.130	<0.130	<0.130	----
Freon 11	75-69-4	0.280	mg/m³		<0.280	<0.280	<0.280	<0.280	----
1.1-Dichloroethene	75-35-4	0.200	mg/m³		<0.200	<0.200	<0.200	<0.200	----
Dichloromethane	75-09-2	0.170	mg/m³		<0.170	<0.170	<0.170	<0.170	----
Freon 113	76-13-1	0.380	mg/m³		<0.380	<0.380	<0.380	<0.380	----
1.1-Dichloroethane	75-34-3	0.200	mg/m³		<0.200	<0.200	<0.200	<0.200	----
cis-1.2-Dichloroethene	156-59-2	0.0200	mg/m³		<0.0200	<0.0200	<0.0200	<0.0200	----
Chloroform	67-66-3	0.240	mg/m³		<0.240	<0.240	<0.240	<0.240	----
1.2-Dichloroethane	107-06-2	0.200	mg/m³		<0.200	<0.200	<0.200	<0.200	----
1.1.1-Trichloroethane	71-55-6	0.270	mg/m³		<0.270	<0.270	<0.270	<0.270	----
Benzene	71-43-2	0.100	mg/m³		<0.100	<0.100	<0.100	<0.100	----
Carbon Tetrachloride	56-23-5	0.310	mg/m³		<0.310	<0.310	<0.310	<0.310	----
1.2-Dichloropropane	78-87-5	0.230	mg/m³		<0.230	<0.230	<0.230	<0.230	----
Trichloroethene	79-01-6	0.0054	mg/m³		<0.0054	<0.0054	<0.0054	<0.0054	----
cis-1.3-Dichloropropylene	10061-01-5	0.230	mg/m³		<0.230	<0.230	<0.230	<0.230	----
trans-1.3-Dichloropropene	10061-02-6	0.230	mg/m³		<0.230	<0.230	<0.230	<0.230	----
1.1.2-Trichloroethane	79-00-5	0.270	mg/m³		<0.270	<0.270	<0.270	<0.270	----
Toluene	108-88-3	0.190	mg/m³		<0.190	<0.190	<0.190	<0.190	----
1.2-Dibromoethane (EDB)	106-93-4	0.380	mg/m³		<0.380	<0.380	<0.380	<0.380	----
Tetrachloroethene	127-18-4	0.340	mg/m³		<0.340	<0.340	<0.340	<0.340	----
Chlorobenzene	108-90-7	0.230	mg/m³		<0.230	<0.230	<0.230	<0.230	----
Ethylbenzene	100-41-4	0.220	mg/m³		<0.220	<0.220	<0.220	<0.220	----
meta- & para-Xylene	108-38-3 106-42-3	0.430	mg/m³		<0.430	<0.430	<0.430	<0.430	----
Styrene	100-42-5	0.210	mg/m³		<0.210	<0.210	<0.210	<0.210	----
1.1.2.2-Tetrachloroethane	79-34-5	0.340	mg/m³		<0.340	<0.340	<0.340	<0.340	----
ortho-Xylene	95-47-6	0.220	mg/m³		<0.220	<0.220	<0.220	<0.220	----
4-Ethyltoluene	622-96-8	0.240	mg/m³		<0.240	<0.240	<0.240	<0.240	----
Total Xylenes	----	0.650	mg/m³		<0.650	<0.650	<0.650	<0.650	----
1.3.5-Trimethylbenzene	108-67-8	0.240	mg/m³		<0.240	<0.240	<0.240	<0.240	----

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Analytical Results

Sub-Matrix: SOIL GAS (Matrix: AIR)				Client sample ID	PIN1 C739_S086	PIN1 DUP C816_S086	PIN2 C5068_S182	PIN3 C1086_S228	----
				Client sampling date / time	04-Jun-2020 10:38	04-Jun-2020 10:38	04-Jun-2020 10:43	04-Jun-2020 11:21	----
Compound	CAS Number	LOR	Unit		EN2004068-001	EN2004068-002	EN2004068-003	EN2004068-004	----
					Result	Result	Result	Result	----
EP101: VOCs by USEPA Method TO15 (Calculated Concentration) - Continued									
1.2.4-Trimethylbenzene	95-63-6	0.240	mg/m³		<0.240	<0.240	<0.240	<0.240	----
1.3-Dichlorobenzene	541-73-1	0.300	mg/m³		<0.300	<0.300	<0.300	<0.300	----
Benzylchloride	100-44-7	0.260	mg/m³		<0.260	<0.260	<0.260	<0.260	----
1.4-Dichlorobenzene	106-46-7	0.300	mg/m³		<0.300	<0.300	<0.300	<0.300	----
1.2-Dichlorobenzene	95-50-1	0.300	mg/m³		<0.300	<0.300	<0.300	<0.300	----
1.2.4-Trichlorobenzene	120-82-1	0.370	mg/m³		<0.370	<0.370	<0.370	<0.370	----
Hexachlorobutadiene	87-68-3	0.530	mg/m³		<0.530	<0.530	<0.530	<0.530	----
Acetone	67-64-1	0.120	mg/m³		<0.120	<0.120	**0.130**	<0.120	----
Bromodichloromethane	75-27-4	0.340	mg/m³		<0.340	<0.340	<0.340	<0.340	----
1.3-Butadiene	106-99-0	0.110	mg/m³		<0.110	<0.110	<0.110	<0.110	----
Carbon disulfide	75-15-0	0.160	mg/m³		<0.160	<0.160	<0.160	<0.160	----
2-Chlorotoluene	95-49-8	0.260	mg/m³		<0.260	<0.260	<0.260	<0.260	----
1-Chloro-2-propene (Allyl chloride)	107-05-1	0.160	mg/m³		<0.160	<0.160	<0.160	<0.160	----
Cyclohexane	110-82-7	0.170	mg/m³		<0.170	<0.170	<0.170	<0.170	----
Dibromochloromethane	124-48-1	0.430	mg/m³		<0.430	<0.430	<0.430	<0.430	----
1.4-Dioxane	123-91-1	0.180	mg/m³		<0.180	<0.180	<0.180	<0.180	----
Ethylacetate	9002-89-5	0.180	mg/m³		<0.180	<0.180	<0.180	<0.180	----
trans-1.2-Dichloroethene	156-60-5	0.200	mg/m³		<0.200	<0.200	<0.200	<0.200	----
Heptane	142-82-5	0.200	mg/m³		<0.200	<0.200	**0.500**	<0.200	----
Hexane	110-54-3	0.180	mg/m³		<0.180	<0.180	**0.408**	<0.180	----
Isooctane	540-84-1	0.230	mg/m³		<0.230	<0.230	**11.4**	<0.230	----
Isopropyl Alcohol	67-63-0	0.120	mg/m³		<0.120	<0.120	<0.120	<0.120	----
2-Butanone (MEK)	78-93-3	0.150	mg/m³		<0.150	<0.150	<0.150	<0.150	----
Methyl iso-Butyl ketone	108-10-1	0.200	mg/m³		<0.200	<0.200	<0.200	<0.200	----
2-Hexanone (MBK)	591-78-6	0.200	mg/m³		<0.200	<0.200	<0.200	<0.200	----
Propene	115-07-1	0.0900	mg/m³		<0.0900	<0.0900	<0.0900	<0.0900	----
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.180	mg/m³		<0.180	<0.180	<0.180	<0.180	----
Tetrahydrofuran	109-99-9	0.150	mg/m³		<0.150	<0.150	<0.150	<0.150	----
Bromoform	75-25-2	0.520	mg/m³		<0.520	<0.520	<0.520	<0.520	----
Vinyl Acetate	108-05-4	0.180	mg/m³		<0.180	<0.180	<0.180	<0.180	----
Vinyl bromide	593-60-2	0.220	mg/m³		<0.220	<0.220	<0.220	<0.220	----
Acetonitrile	75-05-8	0.0800	mg/m³		<0.0800	<0.0800	<0.0800	<0.0800	----
Acrolein	107-02-8	0.110	mg/m³		<0.110	<0.110	<0.110	<0.110	----

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Analytical Results

Sub-Matrix: SOIL GAS (Matrix: AIR)				Client sample ID	PIN1 C739_S086	PIN1 DUP C816_S086	PIN2 C5068_S182	PIN3 C1086_S228	-----
				Client sampling date / time	04-Jun-2020 10:38	04-Jun-2020 10:38	04-Jun-2020 10:43	04-Jun-2020 11:21	----
Compound	CAS Number	LOR	Unit		EN2004068-001	EN2004068-002	EN2004068-003	EN2004068-004	--------
					Result	Result	Result	Result	----
EP101: VOCs by USEPA Method TO15 (Calculated Concentration) - Continued									
Acrylonitrile	107-13-1	0.110	mg/m³		<0.110	<0.110	<0.110	<0.110	----
tert-Butyl alcohol	75-65-0	0.150	mg/m³		<0.150	<0.150	<0.150	<0.150	----
2-Chloro-1.3-butadiene	126-99-8	0.180	mg/m³		<0.180	<0.180	<0.180	<0.180	----
Di-isopropyl Ether	108-20-3	0.210	mg/m³		<0.210	<0.210	<0.210	<0.210	----
Ethyl tert-Butyl Ether (ETBE)	637-92-3	0.210	mg/m³		<0.210	<0.210	<0.210	<0.210	----
tert-Amyl Methyl Ether (TAME)	994-05-8	0.210	mg/m³		<0.210	<0.210	<0.210	<0.210	----
Methyl Methacrylate	80-62-6	0.210	mg/m³		<0.210	<0.210	<0.210	<0.210	----
1.1.1.2-Tetrachloroethane	630-20-6	0.340	mg/m³		<0.340	<0.340	<0.340	<0.340	----
Isopropylbenzene	98-82-8	0.250	mg/m³		<0.250	<0.250	<0.250	<0.250	----
n-Propylbenzene	103-65-1	0.250	mg/m³		<0.250	<0.250	<0.250	<0.250	----
tert-Butylbenzene	98-06-6	0.270	mg/m³		<0.270	<0.270	<0.270	<0.270	----
sec-Butylbenzene	135-98-8	0.270	mg/m³		<0.270	<0.270	<0.270	<0.270	----
2-isopropyltoluene	527-84-4	0.270	mg/m³		<0.270	<0.270	<0.270	<0.270	----
n-Butylbenzene	104-51-8	0.270	mg/m³		<0.270	<0.270	<0.270	<0.270	----
Naphthalene	91-20-3	0.100	mg/m³		<0.100	<0.100	<0.100	<0.100	----
EP101: VOCs by USEPA Method TO15r									
Freon 12	75-71-8	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Chloromethane	74-87-3	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Freon 114	76-14-2	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Vinyl chloride	75-01-4	0.0020	ppmv		<0.0020	<0.0020	<0.0020	<0.0020	----
Bromomethane	74-83-9	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Chloroethane	75-00-3	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Freon 11	75-69-4	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
1.1-Dichloroethene	75-35-4	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Dichloromethane	75-09-2	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Freon 113	76-13-1	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
1.1-Dichloroethane	75-34-3	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
cis-1.2-Dichloroethene	156-59-2	0.0050	ppmv		<0.0050	<0.0050	<0.0050	<0.0050	----
Chloroform	67-66-3	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
1.2-Dichloroethane	107-06-2	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
1.1.1-Trichloroethane	71-55-6	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Benzene	71-43-2	0.0300	ppmv		<0.0300	<0.0300	<0.0300	<0.0300	----
Carbon Tetrachloride	56-23-5	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
1.2-Dichloropropane	78-87-5	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----

Analytical Results

Sub-Matrix: SOIL GAS (Matrix: AIR)				Client sample ID	PIN1 C739_S086	PIN1 DUP C816_S086	PIN2 C5068_S182	PIN3 C1086_S228	-----
				Client sampling date / time	04-Jun-2020 10:38	04-Jun-2020 10:38	04-Jun-2020 10:43	04-Jun-2020 11:21	----
Compound	CAS Number	LOR	Unit		EN2004068-001	EN2004068-002	EN2004068-003	EN2004068-004	--------
					Result	Result	Result	Result	----
EP101: VOCs by USEPA Method TO15r - Continued									
Trichloroethene	79-01-6	0.0010	ppmv		<0.0010	<0.0010	<0.0010	<0.0010	----
cis-1.3-Dichloropropylene	10061-01-5	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
trans-1.3-Dichloropropene	10061-02-6	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
1.1.2-Trichloroethane	79-00-5	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Toluene	108-88-3	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
1.2-Dibromoethane (EDB)	106-93-4	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Tetrachloroethene	127-18-4	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Chlorobenzene	108-90-7	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Ethylbenzene	100-41-4	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
meta- & para-Xylene	108-38-3 106-42-3	0.100	ppmv		<0.100	<0.100	<0.100	<0.100	----
Styrene	100-42-5	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
1.1.2.2-Tetrachloroethane	79-34-5	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
ortho-Xylene	95-47-6	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
4-Ethyltoluene	622-96-8	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
1.3.5-Trimethylbenzene	108-67-8	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
1.2.4-Trimethylbenzene	95-63-6	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
1.3-Dichlorobenzene	541-73-1	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Benzylchloride	100-44-7	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
1.4-Dichlorobenzene	106-46-7	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
1.2-Dichlorobenzene	95-50-1	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
1.2.4-Trichlorobenzene	120-82-1	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Hexachlorobutadiene	87-68-3	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Acetone	67-64-1	0.0500	ppmv		<0.0500	<0.0500	0.0550	<0.0500	----
Bromodichloromethane	75-27-4	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
1.3-Butadiene	106-99-0	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Carbon disulfide	75-15-0	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
2-Chlorotoluene	95-49-8	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
1-Chloro-2-propene (Allyl chloride)	107-05-1	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Cyclohexane	110-82-7	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Dibromochloromethane	124-48-1	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
1.4-Dioxane	123-91-1	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Ethylacetate	9002-89-5	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
trans-1.2-Dichloroethene	156-60-5	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----

Analytical Results

Sub-Matrix: SOIL GAS (Matrix: AIR)				Client sample ID	PIN1 C739_S086	PIN1 DUP C816_S086	PIN2 C5068_S182	PIN3 C1086_S228	----
				Client sampling date / time	04-Jun-2020 10:38	04-Jun-2020 10:38	04-Jun-2020 10:43	04-Jun-2020 11:21	----
Compound	CAS Number	LOR	Unit		EN2004068-001	EN2004068-002	EN2004068-003	EN2004068-004	--------
					Result	Result	Result	Result	----
EP101: VOCs by USEPA Method TO15r - Continued									
Heptane	142-82-5	0.0500	ppmv		<0.0500	<0.0500	**0.122**	<0.0500	----
Hexane	110-54-3	0.0500	ppmv		<0.0500	<0.0500	**0.116**	<0.0500	----
Isooctane	540-84-1	0.0500	ppmv		<0.0500	<0.0500	**2.45**	<0.0500	----
Isopropyl Alcohol	67-63-0	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
2-Butanone (MEK)	78-93-3	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Methyl iso-Butyl ketone	108-10-1	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
2-Hexanone (MBK)	591-78-6	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Propene	115-07-1	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Tetrahydrofuran	109-99-9	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Bromoform	75-25-2	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Vinyl Acetate	108-05-4	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Vinyl bromide	593-60-2	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Acetonitrile	75-05-8	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Acrolein	107-02-8	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Acrylonitrile	107-13-1	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
tert-Butyl alcohol	75-65-0	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
2-Chloro-1.3-butadiene	126-99-8	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Di-isopropyl Ether	108-20-3	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Ethyl tert-Butyl Ether (ETBE)	637-92-3	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
tert-Amyl Methyl Ether (TAME)	994-05-8	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Methyl Methacrylate	80-62-6	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
1.1.1.2-Tetrachloroethane	630-20-6	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Isopropylbenzene	98-82-8	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
n-Propylbenzene	103-65-1	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
tert-Butylbenzene	98-06-6	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
sec-Butylbenzene	135-98-8	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
2-isopropyltoluene	527-84-4	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
n-Butylbenzene	104-51-8	0.0500	ppmv		<0.0500	<0.0500	<0.0500	<0.0500	----
Naphthalene	91-20-3	0.0190	ppmv		<0.0190	<0.0190	<0.0190	<0.0190	----
EP103: Petroleum Hydrocarbons in Gaseous Samples									
C6 - C9 Fraction	---	5.00	ppmv		<5.00	<5.00	**24.4**	<5.00	----
C10 - C14 Fraction	---	5.00	ppmv		<5.00	<5.00	**10.0**	<5.00	----
EP103: Petroleum Hydrocarbons in Gaseous Samples (Calc Conc)									

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Analytical Results

Sub-Matrix: SOIL GAS (Matrix: AIR)				Client sample ID	PIN1 C739_S086	PIN1 DUP C816_S086	PIN2 C5068_S182	PIN3 C1086_S228	----
				Client sampling date / time	04-Jun-2020 10:38	04-Jun-2020 10:38	04-Jun-2020 10:43	04-Jun-2020 11:21	----
Compound	CAS Number	LOR	Unit		EN2004068-001	EN2004068-002	EN2004068-003	EN2004068-004	--------
					Result	Result	Result	Result	----
EP103: Petroleum Hydrocarbons in Gaseous Samples (Calc Conc) - Continued									
C6 - C9 Fraction	----	20.0	mg/m³		<20.0	<20.0	99.7	<20.0	----
C10 - C14 Fraction	----	35.0	mg/m³		<35.0	<35.0	69.5	<35.0	----
EP103: Total Recoverable Hydrocarbons - NEPM 2013									
C6 - C10 Fraction	C6_C10	5.00	ppmv		<5.00	<5.00	23.6	<5.00	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	5.00	ppmv		<5.00	<5.00	23.6	<5.00	----
>C10 - C16 Fraction	----	5.00	ppmv		<5.00	<5.00	7.20	<5.00	----
>C10 - C16 Fraction minus Naphthalene (F2)	----	5.00	ppmv		<5.00	<5.00	7.20	<5.00	----
EP103: Total Recoverable Hydrocarbons - NEPM 2013 (Calc Conc)									
C6 - C10 Fraction	C6_C10	20.0	mg/m³		<20.0	<20.0	96.5	<20.0	----
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20.0	mg/m³		<20.0	<20.0	96.3	<20.0	----
>C10 - C16 Fraction	----	40.0	mg/m³		<40.0	<40.0	54.1	<40.0	----
>C10 - C16 Fraction minus Naphthalene (F2)	----	40.0	mg/m³		<40.0	<40.0	54.1	<40.0	----
EP104: Light Hydrocarbons									
Methane	74-82-8	0.050	Mol %		<0.100	<0.100	0.107	<0.100	----
Ethane	74-84-0	0.010	Mol %		<0.020	<0.020	<0.020	<0.020	----
Ethene	74-85-1	0.010	Mol %		<0.020	<0.020	<0.020	<0.020	----
Propane	74-98-6	0.010	Mol %		<0.020	<0.020	<0.020	<0.020	----
Butane	106-97-8	0.05	Mol %		<0.10	<0.10	<0.10	<0.10	----
EP104: Light Hydrocarbons (Calc Conc)									
Methane	74-82-8	330	mg/m³		<660	<660	700	<660	----
Ethane	74-84-0	120	mg/m³		<240	<240	<240	<240	----
Ethene	74-85-1	110	mg/m³		<220	<220	<220	<220	----
Propane	74-98-6	180	mg/m³		<360	<360	<360	<360	----
Butane	106-97-8	1200	mg/m³		<2400	<2400	<2400	<2400	----
EP104: Permanent Gases									
Carbon Dioxide	124-38-9	0.005	Mol %		3.42	3.44	7.12	0.048	----
Carbon Monoxide	630-08-0	0.0005	Mol %		<0.0010	<0.0010	0.0011	<0.0010	----
Hydrogen	1333-74-0	0.005	Mol %		<0.010	<0.010	<0.010	<0.010	----
Helium	7440-59-7	0.005	Mol %		<0.010	<0.010	<0.010	<0.010	----
Oxygen	7782-44-7	0.10	Mol %		15.8	16.4	4.91	20.7	----

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Analytical Results

Sub-Matrix: SOIL GAS (Matrix: AIR)				Client sample ID	PIN1 C739_S086	PIN1 DUP C816_S086	PIN2 C5068_S182	PIN3 C1086_S228	----
				Client sampling date / time	04-Jun-2020 10:38	04-Jun-2020 10:38	04-Jun-2020 10:43	04-Jun-2020 11:21	----
Compound	CAS Number	LOR	Unit		EN2004068-001	EN2004068-002	EN2004068-003	EN2004068-004	--------
					Result	Result	Result	Result	----
EP104: Permanent Gases - Continued									
Inert Gases (N2. Ar) by difference	----	0.10	Mol %		80.8	80.2	87.9	79.2	----
EP104: Permanent Gases (Calc Conc)									
Carbon Dioxide	124-38-9	90	mg/m³		61500	61900	128000	870	----
Carbon Monoxide	630-08-0	6	mg/m³		<12	<12	13	<12	----
Hydrogen	1333-74-0	4	mg/m³		<8	<8	<8	<8	----
Oxygen	7782-44-7	1310	mg/m³		207000	215000	64200	271000	----
Helium	7440-59-7	8	mg/m³		<16	<16	<16	<16	----
Inert Gases (N2. Ar) by difference	----	1100	mg/m³		924000	917000	1000000	907000	----
Sampling Quality Assurance									
Pressure - As received	PRESSURE	0.1	kPaa		105	105	98.0	88.7	----
Pressure - Laboratory Atmosphere	----	0.1	kPaa		103	103	103	103	----
Temperature as Received	----	0.1	°C		20.0	20.0	20.0	20.0	----
Vacuum - As received	----	0.03	Inches Hg		<0.03	<0.03	1.51	4.22	----
USEPA Air Toxics Method TO15r Surrogates									
4-Bromofluorobenzene	460-00-4	0.5	%		91.6	96.2	77.4	96.5	----

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Surrogate Control Limits

Sub-Matrix: SOIL GAS		Recovery Limits (%)	
Compound	CAS Number	Low	High
USEPA Air Toxics Method TO15r Surrogates			
4-Bromofluorobenzene	460-00-4	60	140

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Appendix 2 – ALS QA/QC Certificates

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EN2004068**	Page	: 1 of 4
Client	: **ENVIRONMENTAL SERVICE AND DESIGN PTY LTD**	Laboratory	: Environmental Division Newcastle
Contact	: MR ROD COOPER	Telephone	: +6138549 9630
Project	: 7186	Date Samples Received	: 17-Jun-2020
Site	: ----	Issue Date	: 23-Jun-2020
Sampler	: ROD COOPER	No. of samples received	: 4
Order number	:	No. of samples analysed	: 4

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

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

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Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- NO Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- NO Quality Control Sample Frequency Outliers exist.

Analysis Holding Time Compliance

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

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

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

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

Matrix: AIR

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
EP101: VOCs by USEPA Method TO15r							
Gas Canister - ALS Stainless Steel Silonite (EP101-15X) PIN1 - C739_S086, PIN1 DUP - C816_S086, PIN2 - C5068_S182, PIN3 - C1086_S228	04-Jun-2020	----	----	----	19-Jun-2020	04-Jul-2020	✓
EP103: Petroleum Hydrocarbons in Gaseous Samples							
Gas Canister - ALS Stainless Steel Silonite (EP103-PC) PIN1 - C739_S086, PIN1 DUP - C816_S086, PIN2 - C5068_S182, PIN3 - C1086_S228	04-Jun-2020	----	----	----	19-Jun-2020	04-Jul-2020	✓
EP103: Total Recoverable Hydrocarbons - NEPM 2013							
Gas Canister - ALS Stainless Steel Silonite (EP103-PC) PIN1 - C739_S086, PIN1 DUP - C816_S086, PIN2 - C5068_S182, PIN3 - C1086_S228	04-Jun-2020	----	----	----	19-Jun-2020	04-Jul-2020	✓
EP104: Light Hydrocarbons							
Gas Canister - ALS Stainless Steel Silonite (EP104) PIN1 - C739_S086, PIN1 DUP - C816_S086, PIN2 - C5068_S182, PIN3 - C1086_S228	04-Jun-2020	----	----	----	21-Jun-2020	04-Jul-2020	✓
EP104: Permanent Gases							
Gas Canister - ALS Stainless Steel Silonite (EP104) PIN1 - C739_S086, PIN1 DUP - C816_S086, PIN2 - C5068_S182, PIN3 - C1086_S228	04-Jun-2020	----	----	----	21-Jun-2020	04-Jul-2020	✓
Sampling Quality Assurance							
Gas Canister - ALS Stainless Steel Silonite (CAN-001) PIN1 - C739_S086, PIN1 DUP - C816_S086, PIN2 - C5068_S182, PIN3 - C1086_S228	04-Jun-2020	----	----	----	18-Jun-2020	04-Jun-2021	✓

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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: AIR

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	
Duplicate Control Samples (DCS)							
Permanent Gases and Light Hydrocarbons	EP104	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
VOCs in Air by USEPA TO15r - Extended Suite	EP101-15X	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile TPH/TRH in Gaseous Samples	EP103-PC	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Duplicates (DUP)							
Permanent Gases and Light Hydrocarbons	EP104	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
VOCs in Air by USEPA TO15r - Extended Suite	EP101-15X	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile TPH/TRH in Gaseous Samples	EP103-PC	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Permanent Gases and Light Hydrocarbons	EP104	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
VOCs in Air by USEPA TO15r - Extended Suite	EP101-15X	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile TPH/TRH in Gaseous Samples	EP103-PC	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Permanent Gases and Light Hydrocarbons	EP104	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
VOCs in Air by USEPA TO15r - Extended Suite	EP101-15X	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile TPH/TRH in Gaseous Samples	EP103-PC	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

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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
Canister Sampling - Field Data	CAN-001	AIR	In house: Referenced to USEPA TO14 / TO15
VOCs in Air by USEPA TO15r - Extended Suite	EP101-15X	AIR	In house: Referenced to USEPA TO15r Volatile Organic Compounds in Air by USEPA TO15. Extended Suite
VOCs in Air by USEPA TO15r - Extended Suite (mass/volume)	EP101-15X-MV	AIR	In house: Referenced to USEPA TO15r Volatile Organic Compounds in Air by USEPA TO15. Extended Suite (Calculated Concentration)
Volatile TPH/TRH in Gaseous Samples	EP103-PC	AIR	Volatile TPH/TRH by GC-MS with Preconcentration and Thermal Desorption Injection Based on USEPA TO15, MassDEP APH (Rev1 2009) and TPH/NEPM Fractions (2013)
Volatile TPH/TRH in Gaseous Samples (Calc Conc)	EP103-PC-MV	AIR	Volatile TPH/TRH by GC-MS with Preconcentration and Thermal Desorption Injection Based on USEPA TO15, MassDEP APH (Rev1 2009) and TPH/NEPM Fractions (2013) Calculated from ppbv results based on given Temperature and Atmospheric Pressure and mid-range molecular weights
Permanent Gases and Light Hydrocarbons	EP104	AIR	Hydrocarbons, Carbon Dioxide and Carbon Monoxide by GC-FID-TCD. Gases by GC-TCD In house: Referenced to ASTM D1945 applied to Gases and Light Hydrocarbons (C1-C4) using capillary GC
Permanent Gases and Light Hydrocarbons (mass/volume)	EP104-MV	AIR	Permanent Gases and Light Hydrocarbons - Calculated as mass/volume concentration from percentage composition and given termperature and pressure.

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ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EN2004068	Page	: 1 of 4
Client	: ENVIRONMENTAL SERVICE AND DESIGN PTY LTD	Laboratory	: Environmental Division Newcastle
Contact	: MR ROD COOPER	Telephone	: +6138549 9630
Project	: 7186	Date Samples Received	: 17-Jun-2020
Site	: ----	Issue Date	: 23-Jun-2020
Sampler	: ROD COOPER	No. of samples received	: 4
Order number	:	No. of samples analysed	: 4

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1-363

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- NO Matrix Spike outliers occur.
- For all regular sample matrices, NO surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

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Outliers : Frequency of Quality Control Samples

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Matrix: AIR

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
EP101: VOCs by USEPA Method TO15r							
Gas Canister - ALS Stainless Steel Silonite (EP101-15X) PIN1 - C739_S086, PIN1 DUP - C816_S086, PIN2 - C5068_S182, PIN3 - C1086_S228	04-Jun-2020	----	----	----	19-Jun-2020	04-Jul-2020	✓
EP103: Petroleum Hydrocarbons in Gaseous Samples							
Gas Canister - ALS Stainless Steel Silonite (EP103-PC) PIN1 - C739_S086, PIN1 DUP - C816_S086, PIN2 - C5068_S182, PIN3 - C1086_S228	04-Jun-2020	----	----	----	19-Jun-2020	04-Jul-2020	✓
EP103: Total Recoverable Hydrocarbons - NEPM 2013							
Gas Canister - ALS Stainless Steel Silonite (EP103-PC) PIN1 - C739_S086, PIN1 DUP - C816_S086, PIN2 - C5068_S182, PIN3 - C1086_S228	04-Jun-2020	----	----	----	19-Jun-2020	04-Jul-2020	✓
EP104: Light Hydrocarbons							
Gas Canister - ALS Stainless Steel Silonite (EP104) PIN1 - C739_S086, PIN1 DUP - C816_S086, PIN2 - C5068_S182, PIN3 - C1086_S228	04-Jun-2020	----	----	----	21-Jun-2020	04-Jul-2020	✓
EP104: Permanent Gases							
Gas Canister - ALS Stainless Steel Silonite (EP104) PIN1 - C739_S086, PIN1 DUP - C816_S086, PIN2 - C5068_S182, PIN3 - C1086_S228	04-Jun-2020	----	----	----	21-Jun-2020	04-Jul-2020	✓
Sampling Quality Assurance							
Gas Canister - ALS Stainless Steel Silonite (CAN-001) PIN1 - C739_S086, PIN1 DUP - C816_S086, PIN2 - C5068_S182, PIN3 - C1086_S228	04-Jun-2020	----	----	----	18-Jun-2020	04-Jun-2021	✓

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Quality Control Parameter Frequency Compliance

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Volatile TPH/TRH in Gaseous Samples	EP103-PC	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Duplicates (DUP)							
Permanent Gases and Light Hydrocarbons	EP104	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
VOCs in Air by USEPA TO15r - Extended Suite	EP101-15X	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile TPH/TRH in Gaseous Samples	EP103-PC	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Permanent Gases and Light Hydrocarbons	EP104	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
VOCs in Air by USEPA TO15r - Extended Suite	EP101-15X	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile TPH/TRH in Gaseous Samples	EP103-PC	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Permanent Gases and Light Hydrocarbons	EP104	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
VOCs in Air by USEPA TO15r - Extended Suite	EP101-15X	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile TPH/TRH in Gaseous Samples	EP103-PC	1	4	25.00	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
Canister Sampling - Field Data	CAN-001	AIR	In house: Referenced to USEPA TO14 / TO15
VOCs in Air by USEPA TO15r - Extended Suite	EP101-15X	AIR	In house: Referenced to USEPA TO15r Volatile Organic Compounds in Air by USEPA TO15. Extended Suite
VOCs in Air by USEPA TO15r - Extended Suite (mass/volume)	EP101-15X-MV	AIR	In house: Referenced to USEPA TO15r Volatile Organic Compounds in Air by USEPA TO15. Extended Suite (Calculated Concentration)
Volatile TPH/TRH in Gaseous Samples	EP103-PC	AIR	Volatile TPH/TRH by GC-MS with Preconcentration and Thermal Desorption Injection Based on USEPA TO15, MassDEP APH (Rev1 2009) and TPH/NEPM Fractions (2013)
Volatile TPH/TRH in Gaseous Samples (Calc Conc)	EP103-PC-MV	AIR	Volatile TPH/TRH by GC-MS with Preconcentration and Thermal Desorption Injection Based on USEPA TO15, MassDEP APH (Rev1 2009) and TPH/NEPM Fractions (2013) Calculated from ppbv results based on given Temperature and Atmospheric Pressure and mid-range molecular weights
Permanent Gases and Light Hydrocarbons	EP104	AIR	Hydrocarbons, Carbon Dioxide and Carbon Monoxide by GC-FID-TCD. Gases by GC-TCD In house: Referenced to ASTM D1945 applied to Gases and Light Hydrocarbons (C1-C4) using capillary GC
Permanent Gases and Light Hydrocarbons (mass/volume)	EP104-MV	AIR	Permanent Gases and Light Hydrocarbons - Calculated as mass/volume concentration from percentage composition and given termperature and pressure.

1-366

Appendix 3 – ES&D UPSS Sampling SOP

es&d Standard Operating Procedure	SOP001	Version:	1.1
	Soil Sampling	Date:	17/04/2020
		Print date:	17/04/2020
		Document not controlled if printed	

1. Sampling Plan

Each soil sampling regime needs to follow a sampling plan. The sampling plan will outline the number and location of samples and what analytes will be tested for.

The minimum number of samples and QAQC samples required will depend on the volume and homogeneity of material, and on the reason for sampling. Table 1 shows guidelines:

Table 1: Sampling Guidelines

Sampling	Reference
Soil classification for disposal	IB105
Soil sampling for UPSS removal	UPSS 2
Site characterisation, classification, validation and assessment	NEPM
Agricultural	DPIPWE

Where:

- IB105 - Information Bulletin No.105 – Classification and Management of Contaminated Soil for Disposal, EPA Tasmania, V3, 2018
- UPSS 2 – EPA Tasmania Technical Guideline, UPSS 2: Decommissioning Assessment – Sampling and Risk Assessment Requirements, V3 2018
- NEPM – National Environment Protection (Assessment of Site Contamination) Measure April 1999 (as amended 2013), Schedule B2: Guideline on Site Characterisation
- DPIPWE – Soil Sampling Procedure, DPIPWE, 2014

Additionally, all soil sampling must be done according to one or both of the following Australian Standards:

- AS 4482.1:2005 Guide to the investigation and sampling of potentially contaminated soil, part 1: Non-volatile and semi-volatile compounds
- AS 4482.2:1999 Guide to the investigation and sampling of potentially contaminated soil, part 2: Volatile substances

And for UPSS removal:

- AS 4976 The Removal and Disposal of Underground Petroleum Storage Tanks

2. Sampling

1. Once the sampling plan has been completed and there is a clear sampling method based on the guidelines and Australian Standards, sampling can proceed.
2. Take a representative sample and place directly into soil jar provided by ALS. A clean pair of nitrile gloves must be worn for each sample, and if sample is taken with a hand tool such as a trowel, auger, spade etc., it must be cleaned between samples.
3. Seal jar immediately after sample collection, especially for volatile samples. Label with sample number, sampler, project number, date and time.
4. Place soil jars into a chilled Esky and freight to ALS Melbourne asap, with a 2 day turnaround.

3. References

Information Bulletin No.105 – Classification and Management of Contaminated Soil for Disposal, EPA Tasmania, V3, 2018

EPA Tasmania Technical Guideline, UPSS 2: Decommissioning Assessment – Sampling and Risk Assessment Requirements, V3 2018

National Environment Protection (Assessment of Site Contamination) Measure April 1999 (as amended 2013), Schedule B2: Guideline on Site Characterisation

DPIPWE – Soil Sampling Procedure, https://dpipwe.tas.gov.au/agriculture/land-management-and-soils/soil-management/soil-sampling (accessed 17/12/19), DPIPWE, 2014

AS 4482.1:2005 Guide to the investigation and sampling of potentially contaminated soil, part 1: Non-volatile and semi-volatile compounds

AS 4482.2:1999 Guide to the investigation and sampling of potentially contaminated soil, part 2: Volatile substances

AS 4976 The Removal and Disposal of Underground Petroleum Storage Tanks

Appendix 4 – UPSS Decommissioning Report

UPSS Decommission

77-79 Main Street Cressy

Project No: 7186

Date: September 2020

es&d
environmental service & design

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Review	R Cooper	ES&D	30/09/2020
Issue	R Cooper	ES&D	15/10/2020

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Executive Summary

Environmental Service and Design (ES&D) were commissioned by their client Butler McIntyre Investments Ltd to prepare a decommissioning assessment report for a disused underground petroleum storage system, located at 77-79 Main St Cressy ("the site"). Property ID 6749768 and Title Reference 102668/9 and 102668/10.

The assessment was conducted by Site Contamination Practitioners Australia (CEnvP) certified practitioner and Site Contamination Specialist Mr. Rod Cooper of ES&D (Certification No. SC40091).

The decommissioning assessment was undertaken to:

- Appropriately decommission and remove an Underground Petroleum Storage System (UPSS);
- Determine whether petroleum hydrocarbons have contaminated the soil or groundwater within the vicinity of the storage system;
- Determine whether this contamination is likely to cause an unacceptable risk to a receptor (including environmental and human receptors);
- Provide recommendations for additional investigation, if required.

The assessment was conducted under the principles and methodology contained within the National Environmental Protection (Assessment of Site Contamination) Measure, 1999 (as amended 2013) and under the Environmental Management and Pollution Control (Underground Petroleum Storage Systems) Regulations 2010 (UPSS Regulations).

This report presents information on site history, geology and results of the soil sampling, along with the interpretation of the chemical testing results with respect to the relevant criteria.

Analytical results are summarised as follows:

- Human health screening levels were exceeded in initial soil samples taken in the UPSS tank pit, beneath associated infrastructure or excavated soil;
- Ecological screening/investigation levels were not exceeded in soil samples taken in the UPSS tank pit or beneath associated infrastructure or excavated soil;

A follow up sample (validation) was taken in association with testing of the surrounding soil. The investigation found that there is acceptable risk to future residential users from soil surrounding the UPSS and to the freshwater ecosystem because of the UPSS.

No management measures or ongoing monitoring is required for the site as there is acceptable risk associated with the UPSS removal and no other UPSS components remaining on the site associated with this system.

1 Introduction

ES&D were commissioned by their client Butler McIntyre Investments Ltd to prepare a decommissioning assessment report for a disused underground petroleum storage system, located at 77-79 Main St Cressy ("the site"). Property ID 6749768 and Title Reference 102668/9 and 102668/10.

Preparation and submission of a report pertaining to the removal of abandoned UPSS to the Director, Environment Protection Authority (EPA) is a requirement under Regulation 31 of the Environmental Management and Pollution Control (Underground Petroleum Storage Systems) Regulations 2010 ("the Regulations"), made under the Environmental Management and Pollution Control Act 1994 ("EMPCA"). The report must include an assessment as to whether any petroleum has contaminated the soil or groundwater near the storage system. This document has been prepared for Butler McIntyre Investments Ltd in accordance with EPA Tasmania – Technical Guideline – Underground Petroleum Storage Systems: Decommissioning assessment report requirements 2014 ("UPSS 1")

Work was conducted in accordance with the requirements of the Regulations, detailed in the EPA Tasmania – Technical Guideline – Underground Petroleum Storage Systems Decommissioning Assessment – Sampling and Risk Assessment Requirements 2014 ("UPSS 2").

The decommissioning and assessment was completed in several stages. Initially it was believed that there were two tanks. As new information was provided on additional tanks and agreement was obtained from the land owner to remove all UPSS associated infrastructure. Liaison with Council occurred to assess the offsite tanks.

1.1 Objectives of the investigation

The objective of the investigation was to determine whether hydrocarbons had dispersed to the environment from the UPSS, and, if so, whether the detected contamination poses an unacceptable risk to receptors identified in the Conceptual Site Model (CSM) and requires further investigation. Residential guidelines were used to allow assessment for the site as a residential use. Residential use is close by.

1.2 Scope of works

Works were carried out by ES&D and Gavandy Contracting and included:

- Removal of two underground petroleum tanks by contractor Gavandy Pty Ltd
- Removal of fuel lines on the eastern and western side
- Collection, preparation and dispatch of soil and pit water samples for laboratory analysis (ES&D)
- Collation and interpretation of analytical results (ES&D)
- Assessment of human health and ecological risks(ES&D)
- Preparation of the assessment report (ES&D).

2 Site Identification and Ownership Information

Site identification and current ownership information is summarised in Table 1.

Figure 1: Site Details

Property ID	6749768
Title Reference	102668/9 and 102668/10
UPSS Address	77-79 Main St, Cressy TAS 7302
UPSS infrastructure owner	Leonard John Williams and Helen Faye Williams
Landowner	Leonard John Williams and Helen Faye Williams
Site area (m^2)	~2016

Refer toFigure 1 (Site Plan).

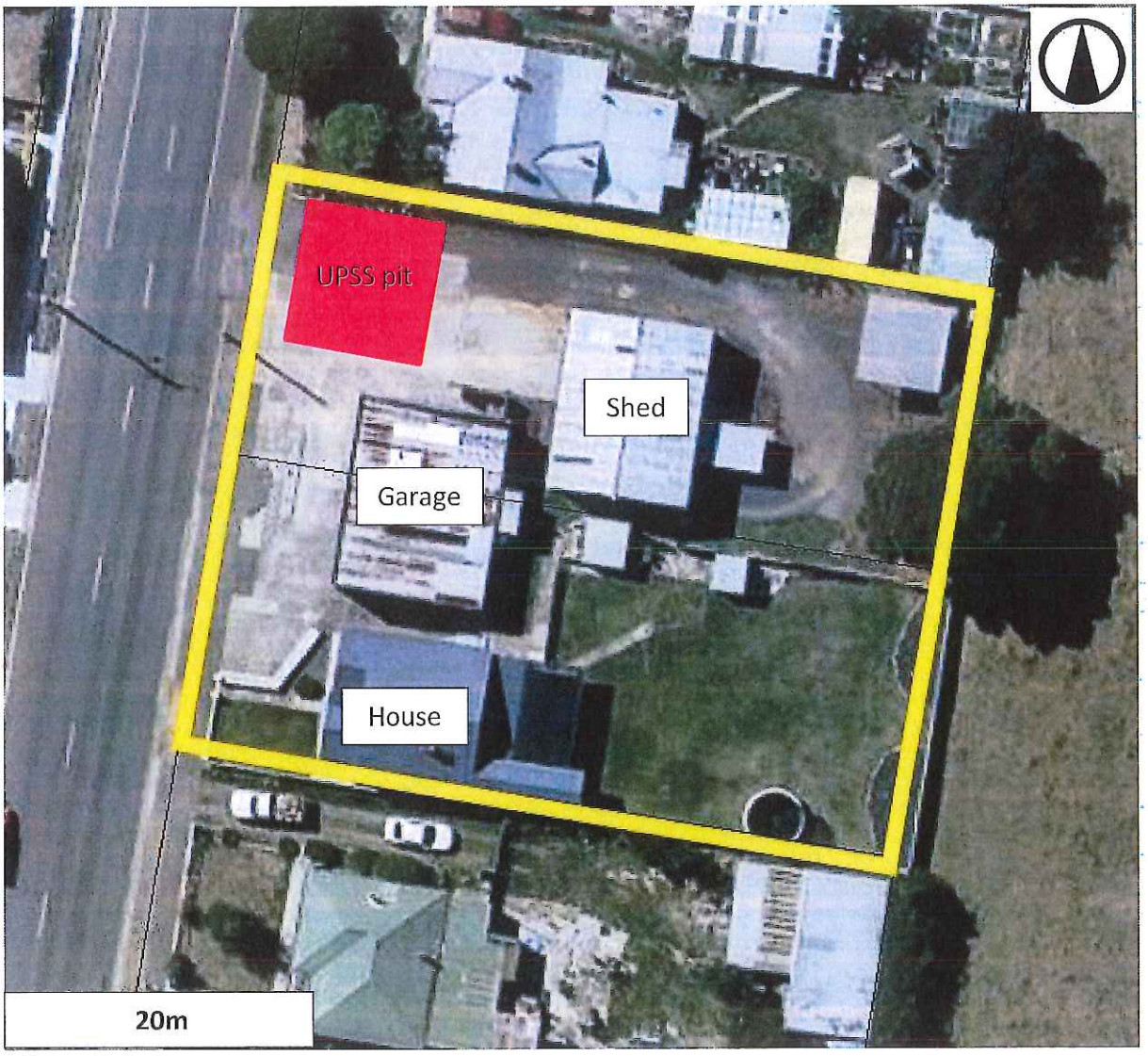


Figure 2: Site Plan

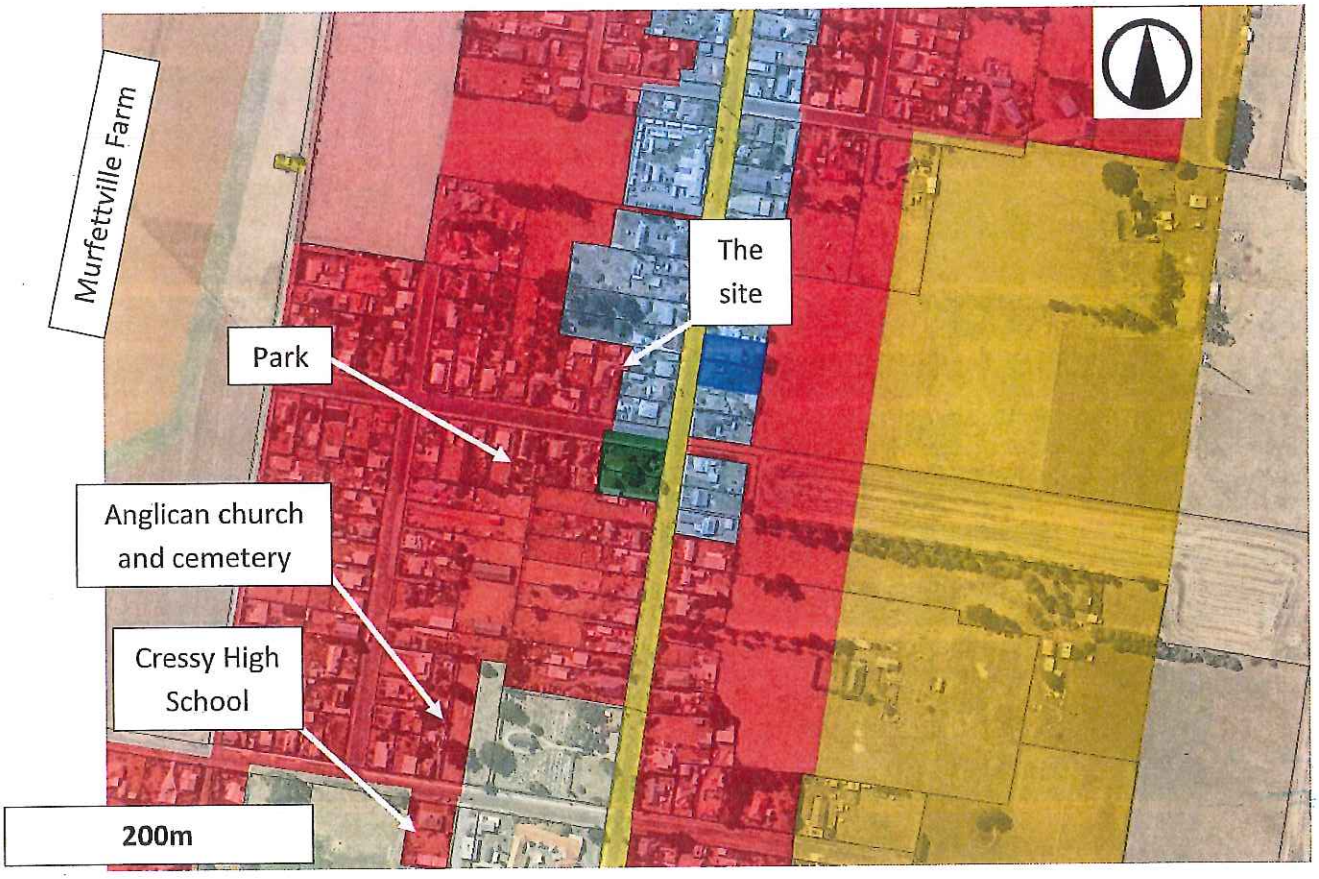
3 Land Use Information

3.1 Current and Proposed Land Use

The site is a former petrol station which contains a garage, shed and single storey dwelling. The proposed development has not been confirmed but will involve the demolition of the garage and shed structures, and the construction of residential units.

3.2 Zoning

The site is located on the main street of Cressy and zoned local business under the Northern Midlands Interim Planning Scheme 2013. This will require changing to residential zoning if the proposed development goes ahead. Figure 2 shows zoning and surrounding properties.



	Local business		Open space		Particular purpose		Rural resource
	Residential		Utilities		Low density residential		Community purpose

Figure 3: Zoning

3.3 Surrounding Land Use

Residential properties are directly to the north and south of the site, and over the road to the west. To the east is rural land. A small park, a church and cemetery, and a school are located to the southwest, see Figure 2.

3.4 Utilities

A TasWater sewer main runs underneath the east of the property, and the water main reaches the site on the southwest, see Figure 3. Dial Before You Dig was consulted by Gavandy Contracting before excavation. EPA have requested an assessment of impact on PVC waterpipes.

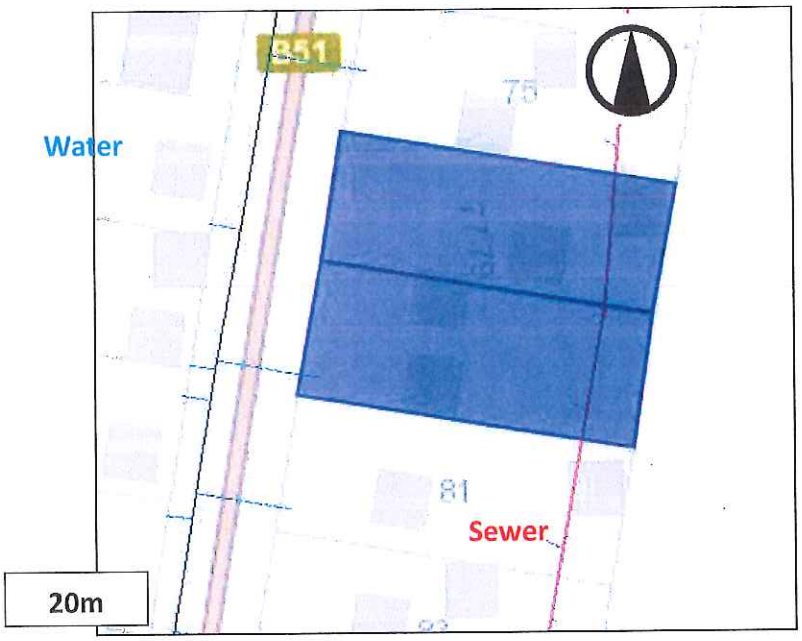


Figure 4: Utilities

4 Site History

There is little information available on the history of the site. The garage appears to have been built between approx. 1945 and 1960 based on the overall style, steel windows and brickwork, and may have been operating as a service station since this time. This cannot be confirmed as there is a lack of historical aerial photography readily available for the Cressy area. It is unknown when it ceased operations.

The dwelling is earlier and of a Californian bungalow style which was popular from approx. 1920 up until WW2.

5 Geology, Hydrology and Hydrogeology

5.1 Topography

According to available data, the site slopes very gently to the west, with contours between 168m AHD, dropping to 167m on the western side.

5.2 Surface Water

The closest surface water to the site is an irrigation channel 360m west. This channel runs through paddocks on Murfettville Farm (the land bordered by Murfet St and Saundridge Rd) and connects with three dams/lagoons on Murfettville; including two larger lagoons 800m northwest, and a small dam 700m west of the site.

There are several drains and small streams to the east of the site, the closest being 390m southeast, which run in an easterly direction towards the Macquarie River 1.5km away.

5.3 Geology

According to TheLISTMap, the site is underlain by poorly consolidated clay, silt and sand of Cretaceous age.

5.4 Hydrogeology

Drinking water is supplied to urban Cressy residents via Taswater infrastructure rather than groundwater bores. There are two bores located between the site and Murfettville, at ~540 and ~440m northwest of the site. Their details are given in Table 2.

Figure 5: Nearby Bores

DPIPWE ID	*Easting*	*Northing*	*Depth*	*Drill date*	*Status*
3816	506313	5385383	146.4	09/12/1970	Abandoned
3817	506413	5385383	140.0	Unknown	Abandoned

There is a local topographic high to the west of the site, indicating groundwater at the site is likely to flow west towards Murfettville. Figure 4 shows inferred regional groundwater flow based on contours, and Figure 5 shows groundwater flow on a local scale.

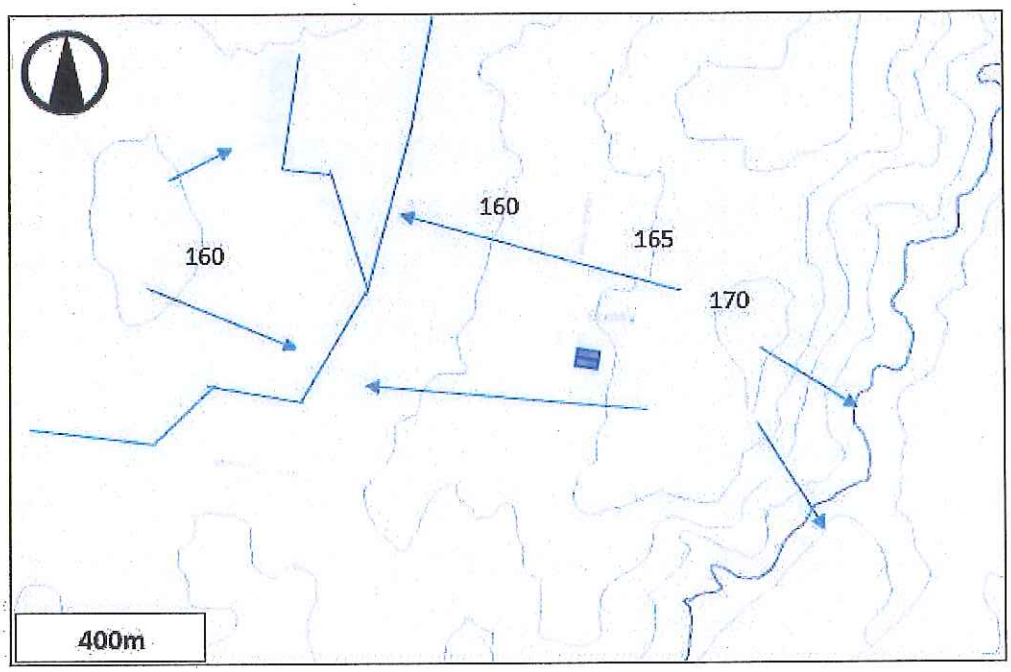


Figure 6: Inferred Regional Groundwater Flow

Blue arrows indicated inferred groundwater flow direction, blue lines show drainage channels

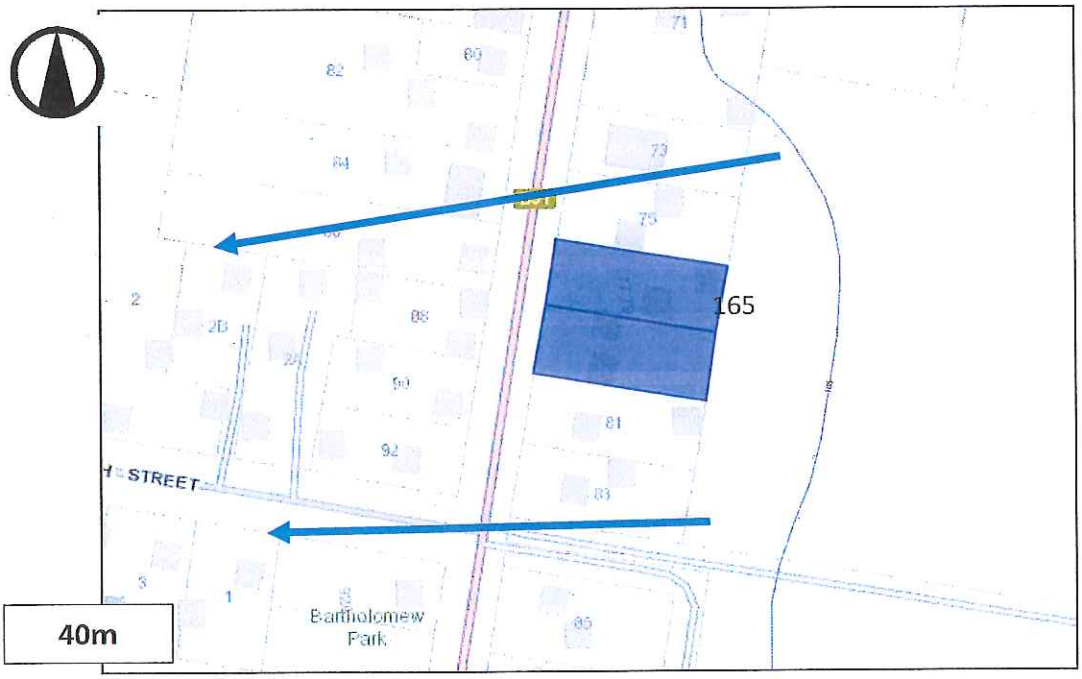


Figure 7: Inferred Local Groundwater Flow

Blue arrows indicated inferred groundwater flow direction

5.5 Acid Sulfate Soils

Acid sulfate soils (ASS) are soils which contain naturally occurring sulfides. If left undisturbed and waterlogged they are harmless, however, exposure to air can cause oxidation which allows subsequent rain events to produce sulfuric acid. A review of the LISTMap confirms that the rock units underlying the site at their elevation have not been mapped as containing ASS, therefore no ASS precautions need to be taken.

5.6 Flora and Fauna

According to the LISTMap, the urban area of Cressy surrounding Main St, including the site, is mapped as 'urban areas' (FUR) under the Tasmanian Vegetation Community mapping scheme TASVEG 3.0. The only other classification within 1km of the site is 'agricultural land' (FAG). Neither of these vegetation communities are listed as threatened under the *Tasmanian Nature Conservation Act 2002*. FUR and FAG are not suitable habitats for native wildlife, although may be accessed while in transit to other sites or while scavenging.

Threatened flora and fauna records do not exist for the site, but do exist for locations within 500m. The slender waterpepper (Persicaria decipiens), Wedge-tailed eagle (Aquila audax), eastern quoll (Dasyurus viverrinus) and Tasmanian devil (Sarcophilus harrisii) have been sited within 500m of the site. These species are unlikely to use the site as the grassed area to the rear of the house is fenced, and there are easier routes to access the Macquarie River and surrounding farmland from Main St (e.g., Spencers Ln, Church St).

5.7 European and Aboriginal Heritage

The site is not listed on the Australian heritage database and is not located within 500m of a heritage property. The site is not listed as a site at risk of impacting Aboriginal relics according to the Aboriginal Heritage property search (record PS0114003).

The site is not located in or within 500m of World Heritage or National Heritage locations, protected wetlands or marine parks, or key ecological features according to the EPBC Act. The site is not listed as a protected site under this Act.

6 Infrastructure on the Site

The client advised that there were two underground tanks on the site and that bowsers had previously been removed. Two underground tanks were removed (April 2020). After the removal of the two underground tanks ES&D was later informed that there may have been additional underground tanks based on dangerous goods records later provided by the client and Worksafe Tasmania.

The photo (refer Figure 6) shows that the bowsers had been removed sometime prior to 2018.

During soil testing under the former bowser pads it was revealed that fuel lines had not been removed.

During the decommissioning process (May to September 2020) the fuel lines were removed and contaminated soils around the fuel lines and former bowser locations were removed and backfilled with rock. All fuel lines up to the boundary of the property were removed.

A ground penetrating radar (GPR) was used on 20 July 2020 to identify all remaining underground fuel lines and remaining underground tanks. Possible underground tanks were identified in the footpath and under the roadway located on Council owned land. Northern Midlands Council was notified of the existence of three possible underground tanks located on Council land under the footpath and roadway (Refer to Figures 9 and 10).

Figure 8: Street view Taken sometime between 2001 and 2018 (Google Earth)

Figure 9: Red outline on roadway is possible underground petroleum tank

Figure 10: Red outline on footpath are indicating the presence of two possible underground petroleum tanks

7 UPSS Information

The UPSS consisted of two tanks in a single pit divided by a clay wall, located in the northwest corner of the site, see Figure 1 for pit location and Table 3 for details. Bowsers and lines were not located.

Figure 11: UPSS Overview

Tank	*Installed*	*Contents*	*Capacity (L)*	*Construction*
1	1989	Super	5,000	6mL steel
2	1989	ULP	10,000	8-10mL steel

Figure 6 shows the layout of the tank pit.

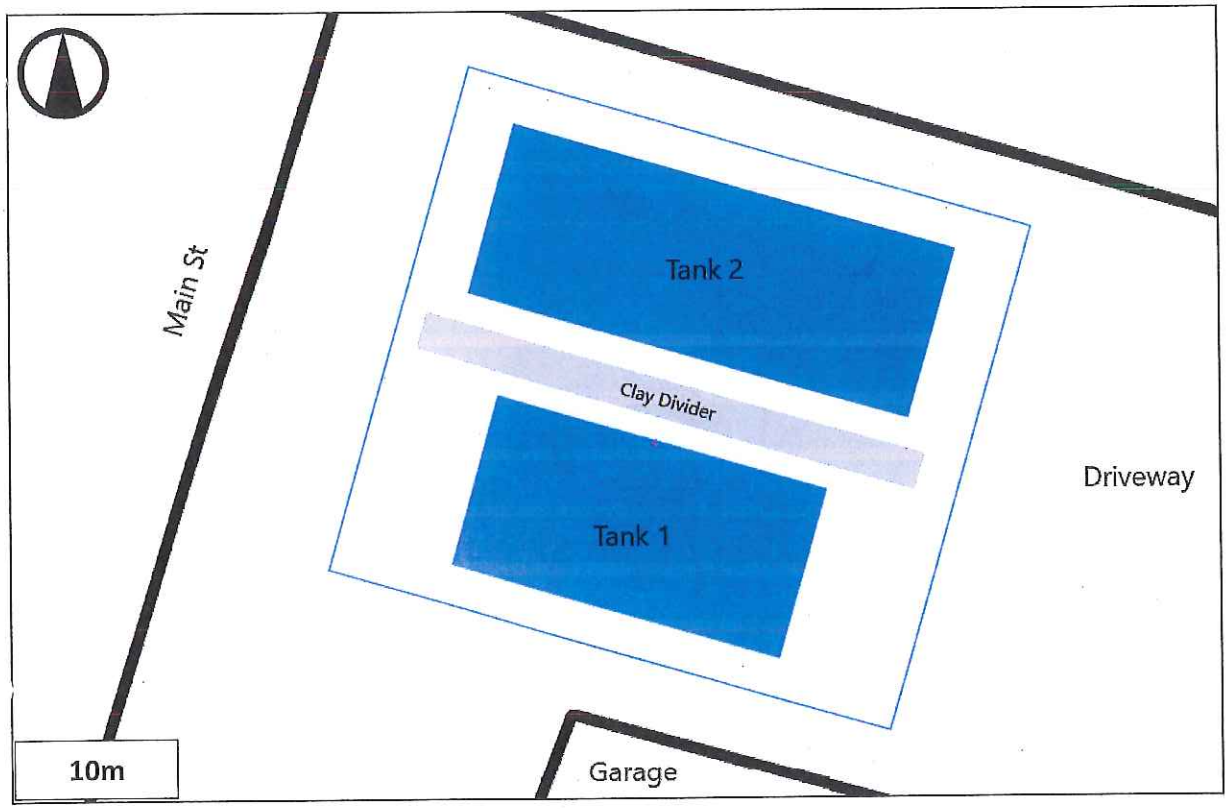


Figure 12: UPSS Detail

7.1 UPSS Removal

The UPSS Removal was managed by G.Rassmussen (ES&D) and Gavandy Pty Ltd. Tank 1 and 2 were removed on the 26th of May 2020, but ES&D were unable to be on site until the 27th May 2020. On arrival at 9:30am on the 27th, G.Rassmussen (ES&D) observed that there was an ambient hydrocarbon odour. Ambient gas readings were taken and are given in Table 4, and a VOC reading over the excavated pit was 0.1ppm.

Figure 13: Ambient gas readings, 27/5/20

	Amt.	*Unit*
CO_2	250	ppm
H_2S	0	ppm
O_2	20.9	%
CO	0	ppm
LEL	0	%

The pit had been backfilled after tank removal on the 26th due to concerns about structural collapse. Photos were taken by Gavandy before the backfill; Figure 7 shows a small amount of surface water in the pit after excavation, and Figure 8 shows the condition of the pit wall.

Figure 14: Tank 1 Pit (Pit 1) After Excavation

Figure 15: Structural Condition of Tank 2 Pit (Pit 2)

The pits were re-excavated to a depth of 2.3m BGSL, and a concrete slab was found to be at the bottom of the tank 1 pit. Pit walls and base were sampled as per Chapter 11. No water was encountered.

7.2 Tank 1

Figure 16 shows tank 1 after excavation. It was found to be in good condition without rust or holes. No water was found in the pit once it was re-excavated.

Figure 16: Tank 1

7.3 Tank 2

Figure 17 shows tank 2 after excavation. It was found to be in good condition without rust or holes. Dampness in the hole after re-excavation appeared to be coming from a downpipe on the adjacent property.

Figure 17: Tank 2

7.4 Remaining Tanks

The site has been surveyed with ground penetrating radar (GPR) and the survey revealed three possible tanks located under the footpath and roadway (refer to Figures 9 and 10). The dangerous goods records indicate that it is likely that these tanks were abandoned in or around 1964 (refer to Figure 18) and were therefore not in use after 31st March 2010 and as such are considered under the *Environmental Management and Pollution Control (Underground Petroleum Storage Systems) Regulations 2020* as 'abandoned' tanks.

8 Potential Receptors

The past use of the site as a service station may have contaminated the groundwater and surrounding soil. Contaminants of potential concern (COPC) include hydrocarbons and heavy metals, such as those used in fuel and oil additives (Pb).

8.1 Human Receptors

Human receptors to potential contaminants include the current and future site residents, residents and users of neighbouring properties, residents and users of properties located downgradient, and any workers who will have

contact with the soil and/or groundwater, such as those involved with excavation. The latter includes any future work occurring on the site. It may also include people involved with irrigation at Murfettville, although contamination would have to be extensive to appear in the irrigation channels in quantities high enough to cause harm.

8.2 Ecological Receptors

Ecological receptors include transient wildlife and stock using the irrigation channels at Murfettville, although it was not noted whether the paddocks were used for cropping or stock. Transient wildlife is unlikely to be affected by any contamination due to the majority of the pit area being covered by concrete. There is a small strip of grass along the northern property boundary and therefore it is still a possibility.

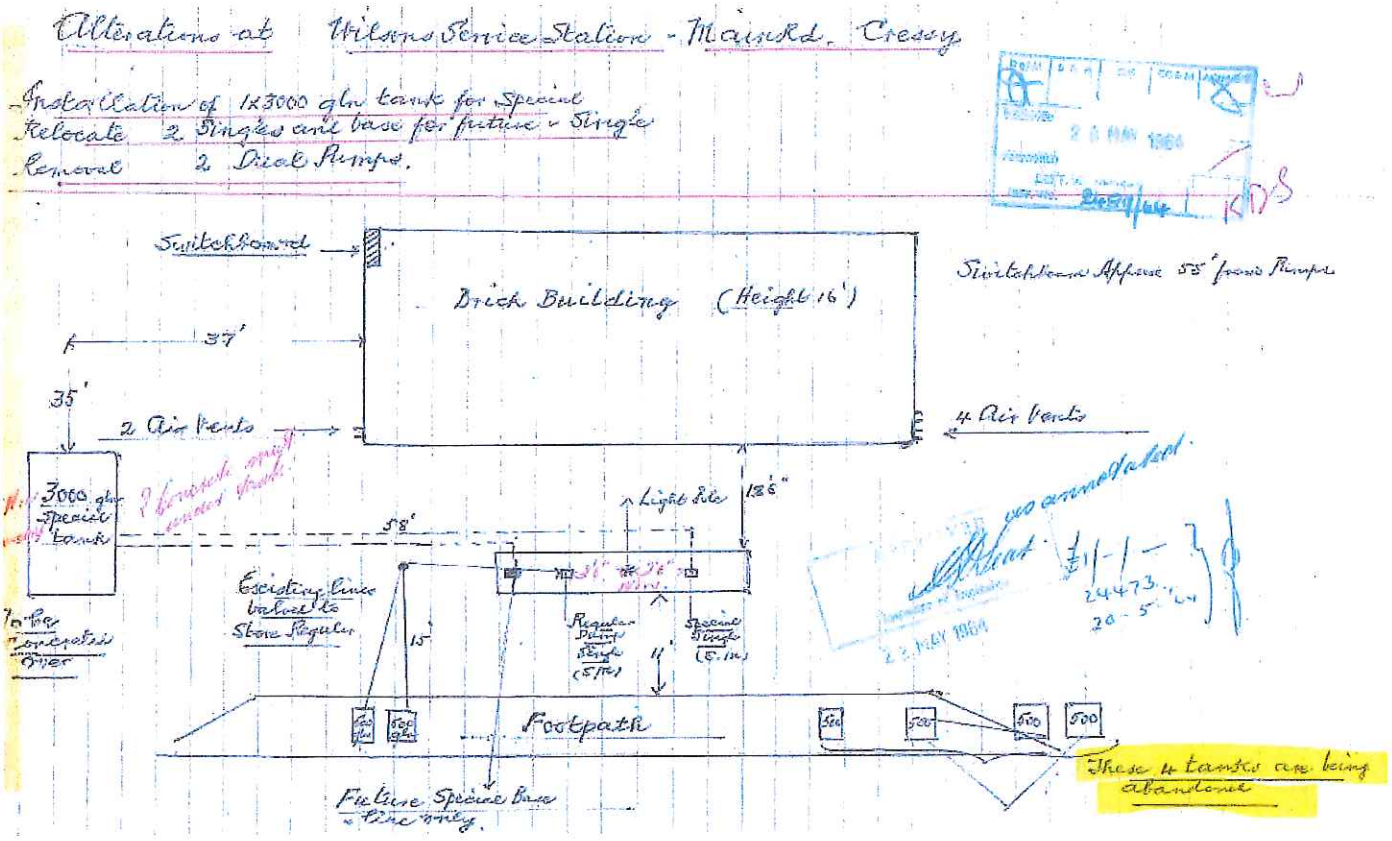


Figure 18: Remaining tanks possibly abandoned around 1964

9 Preliminary Conceptual Site Model

A preliminary Conceptual Site Model (CSM, Table 5) was developed after consideration of risks to potential human and ecological receptors as outlined in Section 7.

Figure 19: Preliminary Conceptual Site Model

Contamination Source	COPC	Pathway	Receptor
Underground petroleum storage systems (UPSS)	• Heavy metals • Aliphatic hydrocarbons • Aromatic hydrocarbons	Vapour inhalation of COPC in surface soils	• Site users • Subsurface workers • Surrounding site users
	• Heavy metals • Aliphatic hydrocarbons • Aromatic hydrocarbons	Dermal contact/ingestion of COPC in surface soils	• Site users • Subsurface workers • Surrounding site users • Transitory wildlife
	• Heavy metals • Aliphatic hydrocarbons • Aromatic hydrocarbons	Migration into soil and groundwater and subsequent ingestion/dermal contact or inhalation of COPC	• Site users • Subsurface workers • Surrounding site users • Transitory wildlife • Murfettville

10 Basis for Assessment

Health Screening Levels (HSLs), Health Investigation Levels (HILs), Ecological Investigation Levels (EILs), Ecological Screening Levels (ESLs) and Groundwater Investigation Levels (GILs) provided in the *National Environmental protection (Assessment of Site Contamination) Measure* 1999, as amended April 11, 2013 (NEPM) were the designated criteria for assessing potential ecological and human health risks posed by hydrocarbon contamination of soil as applicable. NEPM guidelines for residential A were used due to the development proposal being for residential units.

Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC CARE) documents used in the assessment comprised CRC CARE Technical Report No. 10 *"Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater Part 2: Application Document"* (TR10).

With respect to the assessment for lead, the ambient soil background concentration (ABC) is not known. The ABC is normally added to the added contaminant limit (ACL) provided by NEPM to give the EIL value, however the ABC often makes little difference to the ultimate value. For the purposes of this assessment the ACL was considered to be equivalent to the EIL.

All contaminants that could be reasonably expected to disperse to the environment from a UPSS used for storing petroleum products were included in the analytical plan. These comprised Total Petroleum Hydrocarbon/Total Recoverable Hydrocarbon (TPH/TRH) fractions, Benzene, Toluene, Ethylbenzene, Xylene and Naphthalene (BTEXN) and Lead (Pb).

Assessment values are included in the results table, Tables 7-11.

11 Sampling

All sampling was done according to the ES&D Sampling SOP (refer Appendix . Groundwater was not sampled because there was no water in the pits once they were re-excavated, except for minimal surface runoff originating from the gutter downpipe on the adjacent property.

Sample descriptions are given below in Table 6.

Figure 20: Sample Descriptions

Sample ID	*Date*	*Sample Location*	*Matrix*	*Depth (m)*	*Description*	*VOC ppm*
S1	27/5/20	Pit 1 base	Soil	2.3	Sand, no odour or staining	0
S2	27/5/20	Pit 1 wall	Soil	2.3	Sand, no odour or staining	0
S3	27/5/20	Pit 1 wall	Soil	2.3	Sand, no odour or staining	0
S4	27/5/20	Pit 1 wall	Soil	2.3	Sand, no odour or staining	0
S5	27/5/20	Pit 1 wall	Soil	2.3	Duplicate of S4	0
S6	27/5/20	Pit 1 wall	Soil	2.3	Sand, no odour or staining	0
S7	27/5/20	Pit 2 base	Soil	2.3	Sand, odour, staining	287
S8	27/5/20	Pit 2 wall	Soil	2.3	Sand, odour, staining	304
S9	27/5/20	Pit 2 wall	Soil	2.3	Sand, odour, no staining	92.6
S10	27/5/20	Pit 2 wall	Soil	2.3	Sand, odour, staining	97.9
S11	27/5/20	Pit 2 wall	Soil	2.3	Sand, odour, slight staining	270
Stockpile Check	3/6/20	Central pit infill	Soil	2.3	Sand	-
S8 Check	3/6/20	Under original S8	Soil	2.3	Sand	-
Dup	3/6/20	Under original S8	Soil	2.3	Duplicate of S8 Check	-
Fuel 1	20/7/20	Fuel line 1	Soil	0.4	Yellow to grey stained sand, stained, odour	18.0
Fuel 2 0.6	20/7/20	Fuel line 2	Soil	0.6	Mottled clay to green clay, stained, slight odour	3.0
SB1 0.5	20/7/20	Soil bore 1	Soil	0.5	Heavy mottled clay, slight odour	0
SB1 1.0	20/7/20	Soil bore 1	Soil	1.0	Heavy mottled clay	0
SB1 2.0	20/7/20	Soil bore 1	Soil	2.0	Mottled clay to white clay, slight odour	1.2
SB1 3.0	20/7/20	Soil bore 1	Soil	3.0	Heavy white clay, slight odour	0.5
SB1 4.0	20/7/20	Soil bore 1	Soil	4.0	Heavy white clay to mottled clay, slight odour	0
Fuel 2 2.0	20/7/20	Fuel line 2	Soil	2.0	Soft grey clay, slight odour	1.7

Sample ID	Date	Sample Location	Matrix	Depth (m)	Description	VOC ppm
Fuel 2 3.0	20/7/20	Fuel line 2	Soil	3.0	Stiff grey clay, strong odour	25.1
Fuel 2 4.0	20/7/20	Fuel line 2	Soil	4.0	Stiff grey clay, strong odour	33.3
Bowser 3 0.5	20/7/20	Bowser 3	Soil	0.5	Fill sand to soft clay, strong odour	446.7
Bowser 3 1.5	20/7/20	Bowser 3	Soil	1.5	Soft brown clay, strong odour	-
Bowser 3 2.0	20/7/20	Bowser 3	Soil	2.0	White clay, strong odour	82.0
Bowser 2 1.0	20/7/20	Bowser 2	Soil	1.0	Fill sand to mottled clay, strong odour	303
Bowser 2 1.8	20/7/20	Bowser 2	Soil	1.8	Mottled clay, strong odour	281
Bowser 1 0.8	20/7/20	Bowser 1	Soil	0.8	Mottled clay, strong odour	180
Bowser 1 2.0	20/7/20	Bowser 1	Soil	2.0	Mottled clay, strong odour	19.6
Fuel A	6/8/20	Fuel line A	Soil	0.6	Gravelly clay	610
Fuel B	6/8/20	Fuel line B	Soil	0.6	Mottled clay, slight odour	590
Bowser 3	6/8/20	Bowser 3	Soil	2.1	Grey mottled clay, slight odour	660
SB1 1.3	6/8/20	Soil bore 1	Soil	1.3	Grey clay, slight odour	30.4
SB1 1.5	6/8/20	Soil bore 1	Soil	1.5	Grey clay with rock/shale	14.0
SB2 1.0	7/8/20	Soil bore 2	Soil	1.0	Fill sand, clay, staining	82
SB3 0.3	7/8/20	Soil bore 3	Soil	0.3	Gravelly sand	2.6
SB3 1.0	7/8/20	Soil bore 3	Soil	1.0	Mottled clay with shale/rock	0.9
SB4 1.1	7/8/20	Soil bore 4	Soil	1.1	Fill sand, clay, slight odour	0.1
SB5 0.3	7/8/20	Soil bore 5	Soil	0.3	Sandy gravel, stained, odour	15.5
SB5 1.0	7/8/20	Soil bore 5	Soil	1.0	Grey heavy clay, sweet phenolic odour	14.0
SB6 1.0	7/8/20	Soil bore 6	Soil	1.0	Black organic soil	0.3
SB7 0.5	7/8/20	Soil bore 7	Soil	0.5	Clayey sand	0.5
SB8 0.5	7/8/20	Soil bore 8	Soil	0.5	Fill, slight odour, stained	0.4
SB9 0.5	7/8/20	Soil bore 9	Soil	0.5	Sandy fill and clay	1.8
SB9 1.1	7/8/20	Soil bore 9	Soil	1.1	Sandy fill and clay then mottled clay	0.1
F3 0.45	7/8/20	Fuel line 3	Soil	0.45	Very strong odour	1004
F3 0.7	7/8/20	Fuel line 3	Soil	0.7	Very strong odour	178
F3 1.1	7/8/20	Fuel line 3	Soil	1.1	Odour	10.1

Note: "Odour" refers to hydrocarbon odour unless stated

11.1 May Pit Soil Sampling

Soil from the tank pits was sampled on the 27th of May, locations shown in Figure 11. Soil from pit 1 was placed to the side of the pit on the concrete apron and samples from the pit walls were collected. Soil from pit 2 was temporarily placed into pit 1 while samples were collected from the walls of pit 2. Soil from pit 2 was then immediately returned to the pit 2, then pit 1 soil returned to pit 1. A similar procedure was conducted when removing the tanks on the previous day, hence at no stage was the soil considered "stockpiled" and therefore stockpile samples were not taken. Because of this moving around of soil there is no certainty that any of the samples are representative of conditions at the base of the tanks before removal.

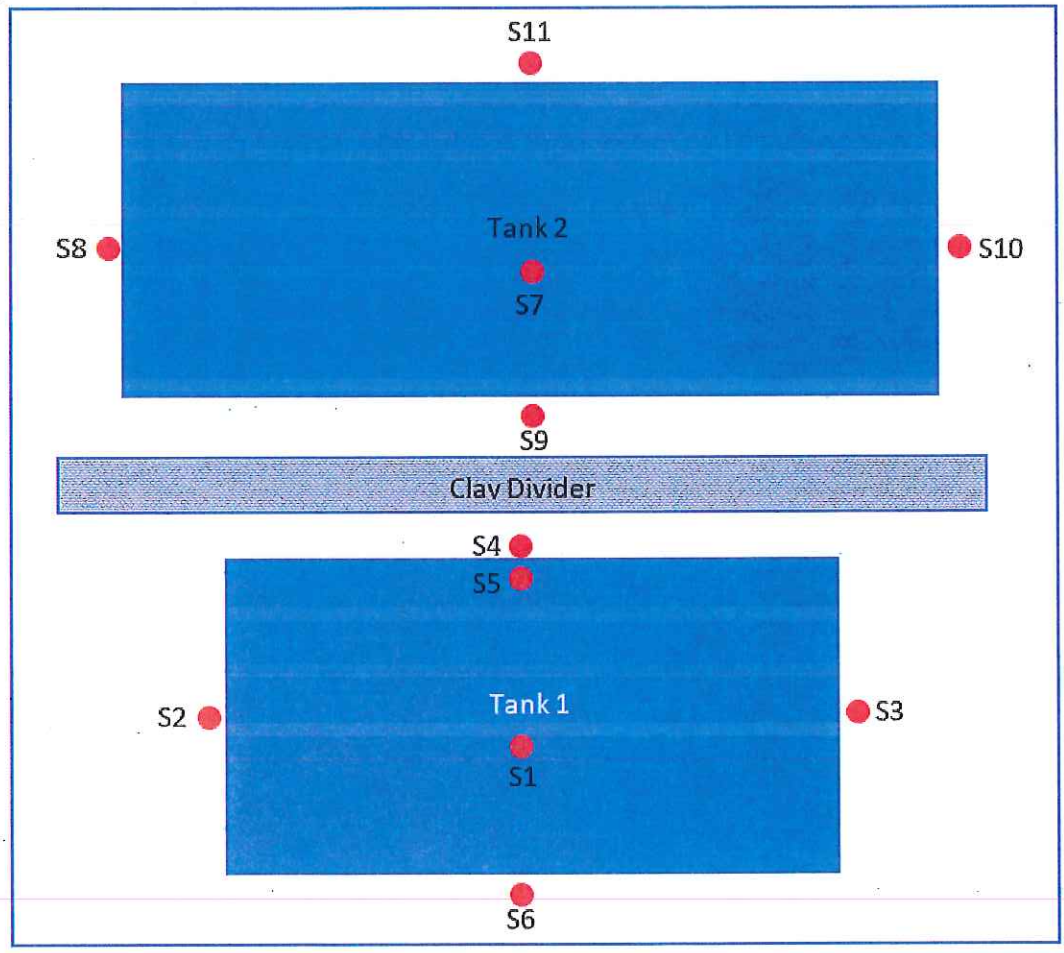


Figure 21: Decommissioning Sampling Points (May 2020)

11.2 June Pit Soil Sampling

S8 was found to be over the NEPM Residential A health guidelines (See Chapter 11), so on the 3rd of June, two extra soil samples were taken as validation samples, as well as a duplicate. The excavator removed soil from the area of the original S8, then took a bucket from below the original base. This was sampled as "S8 check" to determine whether a contamination plume had extended below the base. The infill was then completely removed and sampled as "stockpile check". This sample is representative of soil around S8.

11.3 July Soil Sampling

Upon receipt of the dangerous goods records an investigation into the possible presence of additional underground petroleum tanks was completed. A ground penetrating radar was used to locate additional underground tanks located under the footpath and under the roadway. Two tanks were found under the footpath and one tank was found under the roadway (refer to Figure 15). ES&D notified Northern Midlands Council (J. Galbraith) of the possible presence of underground tanks on Council owned land. At the conclusion of ES&D's investigation Council will determine whether or not they wish to remove the underground tanks or leave them insitu. Based on the WST records it was determined that these two tanks were decommissioned prior to 2011 and the responsibility of council to assess risk.

Investigation on 20 July 2020 revealed that fuel lines remained on the north and southern ends of the former bowser pads as well as vent pipes to the south.

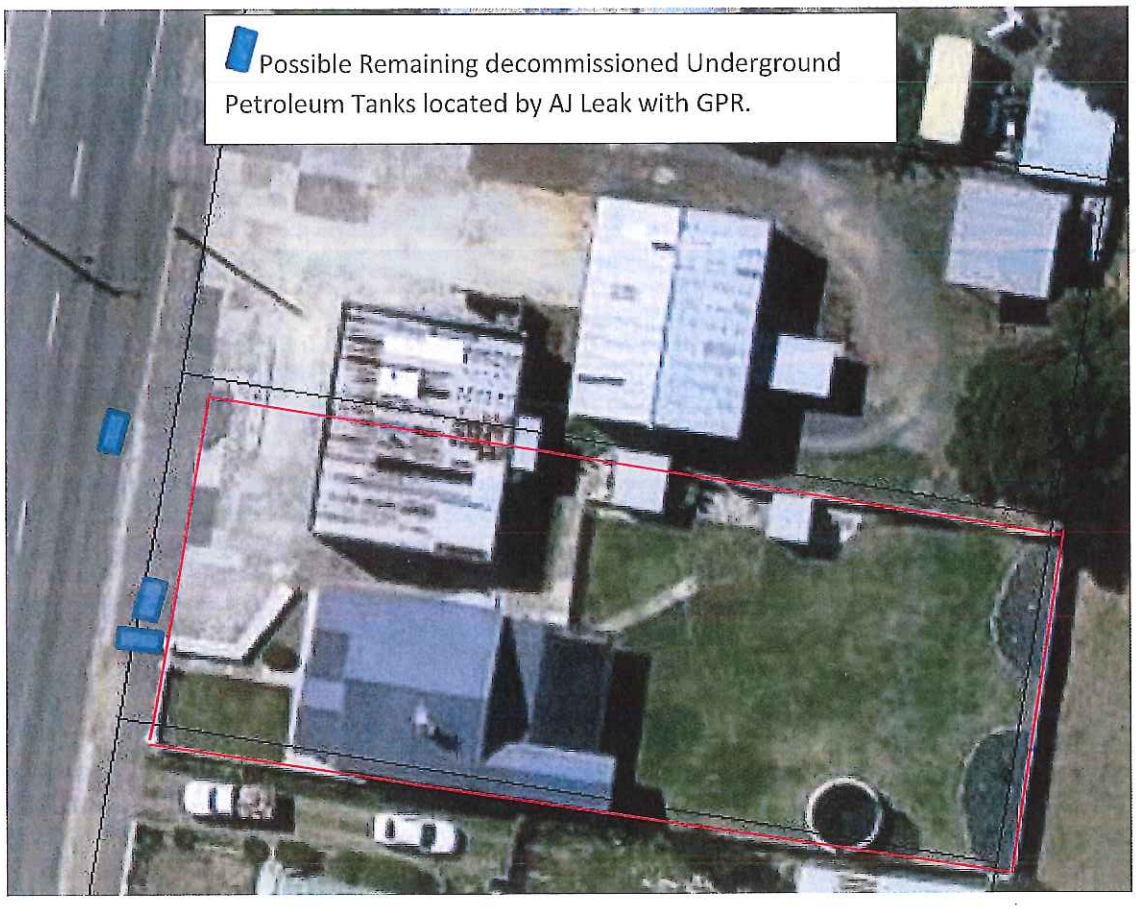


Figure 22: Location of Possible Remaining Underground Fuel Tanks

* Actual Boundary

Sampling Points 20th July 2020

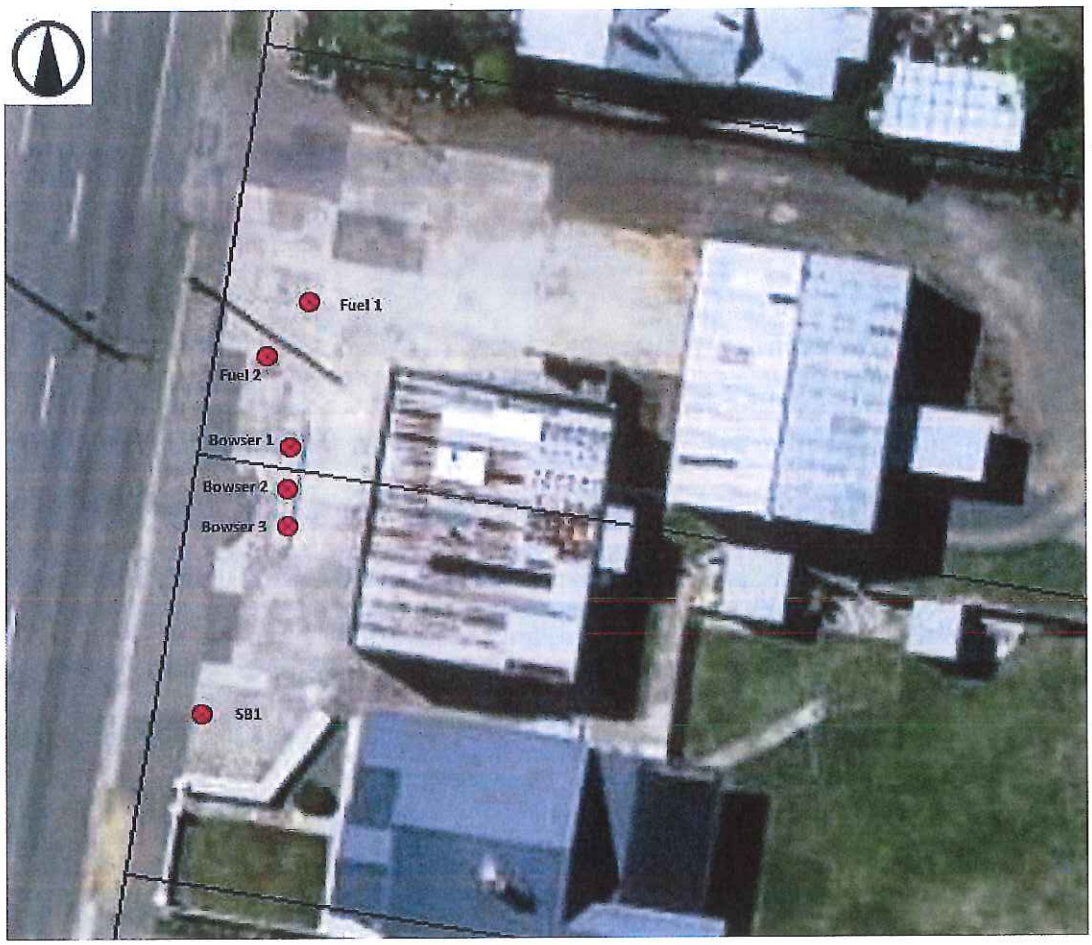


Figure 23: Investigation to determine if fuel lines have been removed from around bowser pad

11.4 6 and 7th August Pit Soil Sampling

On the 6 and 7th August samples were collected under the fuel lines and to the edge of the fuel lines to determine the extent of contaminated soil that would need to be removed. The client wished to confirm the likely extent of soil to be removed prior to completing the removal of the fuel lines and any remediation that may be required.

Soil samples were collected below the fuel lines and to the side of the fuel lines (refer Figure 17)

Sampling Points 6th and 7th August 2020 – Delineated Contamination around former bowsers and fuel lines

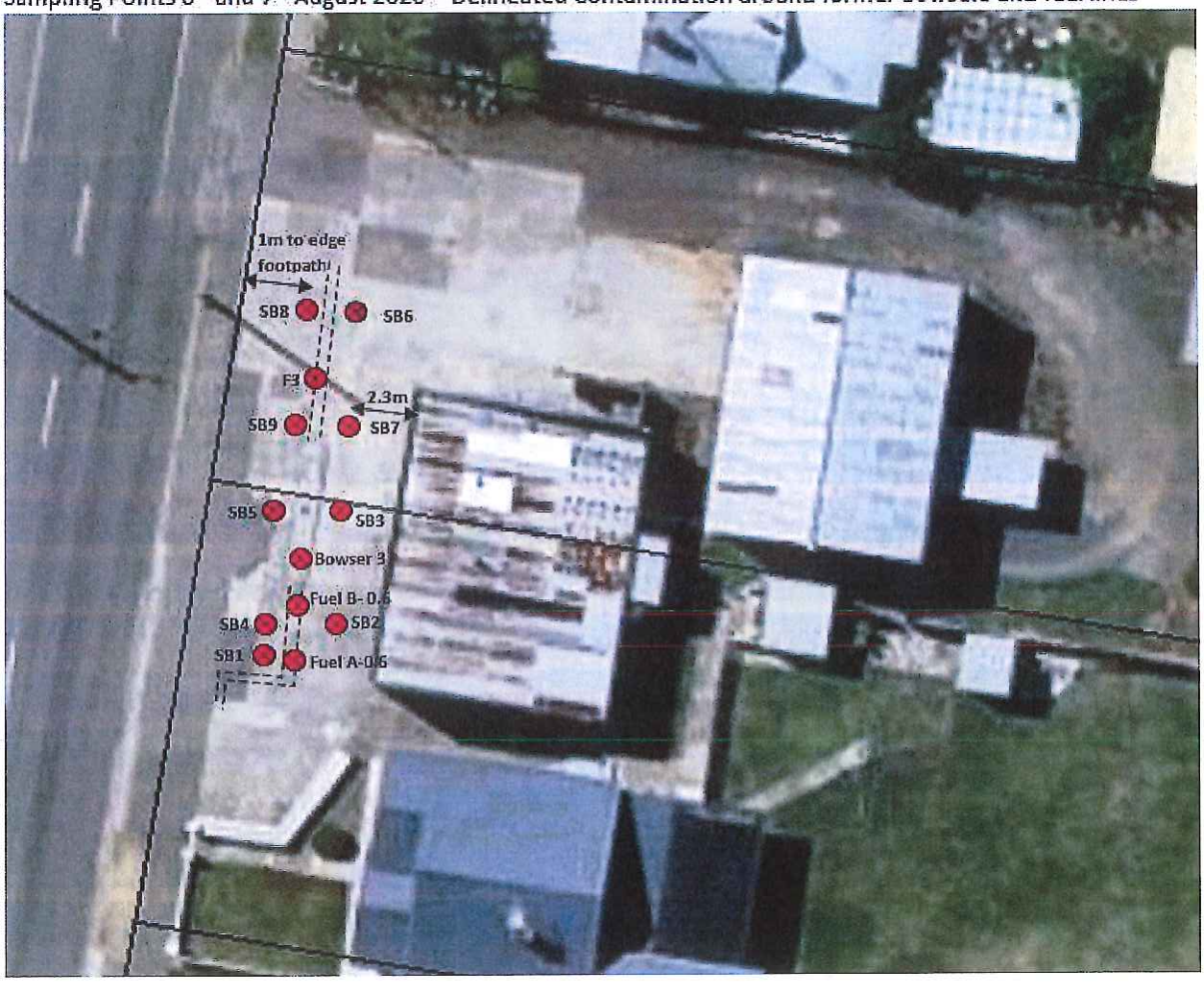


Figure 24: Delineate contamination around former bowser pad and fuel lines

11.5 Decommissioning of Fuel Lines (South) 26 August 2020

Once the extent of contamination around the fuel lines had been understood the first pit to the south of the fuel lines was excavated, fuel lines were removed to the boundary (edge of the footpath) and contaminated soils were removed and stockpiled onsite. A final excavation 3.5 x 3.6 x 1.75m D was completed (refer Figure 18).

Figure 25: removal of Fuel Lines to the South of former bowser pad.

11.6 Decommissioning of Fuel Lines (North) 10 September 2020

The fuel lines located to the north of the former bowser pad were removed and the contaminated soils under and either side of the trench were removed to give a final excavated pit of 15.4 x 3.5 x 1.0-1.75 m D (refer to Figure 19). Soil was screened at each sample location with PID at varying depths to determine the extent of soil to be removed and results from previous investigations in July and August 2020 were used to determine the final depth and width of soil excavation.

Sampling Points 10th September 2020 – Removal of Fuel Lines North and soil under /beside bowser pad

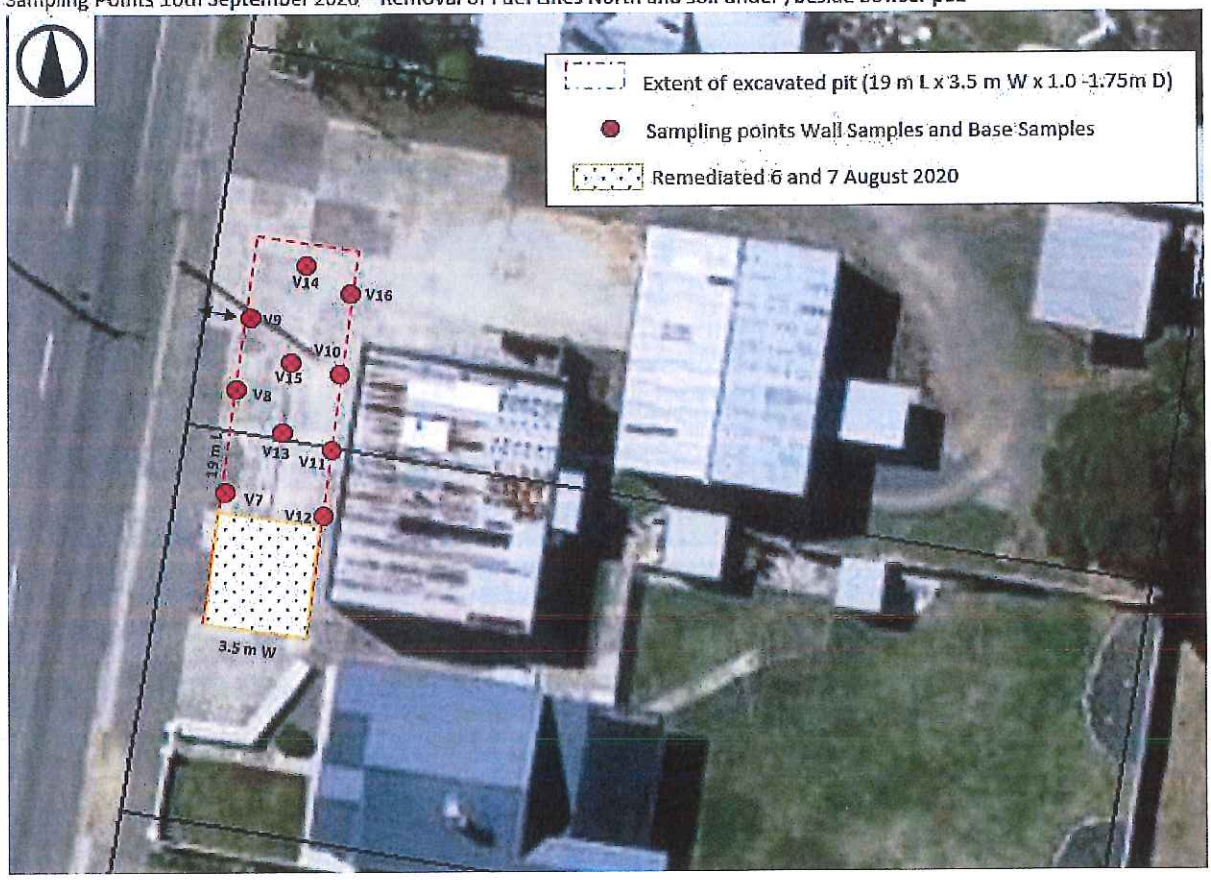


Figure 26: Remove fuel lines to the south of former bowser pad and remove contaminated soils

12 Observations July to September 2020

Strong hydrocarbons odours were detected at the following locations;

- 'Bowser 1', 'Bowser 2' and 'Bowser 3' with odours strongest at 'Bowser 3' from 0.6m and reducing with depth up to 2.0 m
- 'SB1' at 1.0 m reducing with depth
- 'F3' at 0.3 and reducing at 1.1 m
- 'V1' at 1.2 m reducing at 1.75 m
- 'V6' at 1.0 m reducing from 1.5 to 1.75 m

The strong odours seem to be partly due to fuel being transported by surface water/ moisture in the upper sand layer and ceased in the very dense heavy clay from 1.2 to 2.0m. The concrete had regular joins and was in bad condition and this is thought to have allowed entry of surface water. The soil under concrete was wet on the surface even though it had not been raining. The soil was moist from under the concrete and through the profile up to the heavy grey clay layer. The dense grey clay did not seem to be impacted by hydrocarbon odours. A slight odour was observed in the grey clay from 1.5/1.75 mbgs. However, stronger hydrocarbon odours were found to be present in the sand from the surface to 1.0-1.5 and shale from 1.5 to 1.6/1.7 m. A thin layer of shale was present overlying the dense grey clay. The shale layer had a strong odour in places.

Table 1: May June Results

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S C	S8 C	HIL-A*	HSL-A**	ESL***
Date	27/5/20											3/6/20				
ALS Report No.	EM2008991											EM2009595				
Depth (mBGSL):	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3[6]	~2.8			
Metals (mg/kg)																
Lead	<5	<5	<5	<5	<5	<5	5	8	10	13	9	-	-	300		
TPH (mg/kg)																
C6 – C9 Fraction	<10	<10	<10	<10	<10	<10	35	172	48	26	18	39	<10			
C10 – C14 Fraction	<50	<50	<50	<50	<50	<50	<50	90	<50	90	<50	80	<50			
C15 – C28 Fraction	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
C29 – C36 Fraction	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
C10 – C36 Fraction (sum)	<50	<50	<50	<50	<50	<50	<50	90	<50	90	<50	80	<50			
TRH (mg/kg)																
C6 – C10 Fraction	<10	<10	<10	<10	<10	<10	50	260	70	51	32	61	<10			
C6 - C10 Fraction less BTEX (F1)	<10	<10	<10	<10	<10	<10	40	225	54	44	29	52	<10		110	180
>C10 – C16 Fraction	<50	<50	<50	<50	<50	<50	<50	60	<50	70	<50	70	<50			
>C16 - C34 Fraction	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
>C34 - C40 Fraction	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
>C10 – C40 Fraction (sum)	<50	<50	<50	<50	<50	<50	<50	60	<50	70	<50	70	<50			
>C10 - C16 Fraction less Naphthalene (F2)	<50	<50	<50	<50	<50	<50	<50	50	<50	70	<50	70	<50		440	120
BTEXN (mg/kg)																
Benzene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		0.5	50
Toluene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.1	1	0.6	2.2	<0.5	<0.5	<0.5		310	85
Ethylbenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	3.1	1.1	<0.5	<0.5	<0.5	<0.5			70
meta- & para-Xylene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5.2	24.9	10.7	3.4	2.4	6.4	<0.5			
ortho-Xylene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.6	6.3	3.6	1.2	0.7	2.2	<0.5			
Sum of BTEX	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	9.7	35.3	16	6.8	3.1	8.6	<0.2			
Total Xylenes	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6.8	31.2	14.3	4.6	3.1	8.6	<0.5		95	105
Naphthalene	<1	<1	<1	<1	<1	<1	<1	7	<1	<1	1	<1	<1			

Bold indicates a value >LOR, shaded indicates an exceedance.

*Soil HIL for residential A

**Soil HSL for vapour intrusion, sandy soil, residential (tank pit fill soils sampled in May and June were coarse sandy soils)

***Soil ESL for coarse soil, "urban residential and public open space" (tank pit fill soils sampled in May and June were coarse sandy soils). Value for dry soil, used as a guide only.

[6]The overall depth of the pit was 2.3 m so this sample would have a maximum depth of 2.3m.

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Table 2: July Results – Investigation to find fuel lines and determine if soils contaminated around fuel lines and former bowser pad.

20/7/2020 EM2012917	F1 0.4	F2 0.6	F2 2.0	F2 3.0	F2 4.0	SB1 0.5	SB1 1.0	SB1 2.0	SB1 3.0	SB1 4.0	B1 0.8	B1 2.0	B2 1.0	B2 1.8	B3 0.5	B3 1.5	B3 2.0	HIL-A*	HSL-A**				ESL***
Depth (mBGSL):	0.4	0.6	2.0	3.0	4.0	0.5	1.0	2.0	3.0	4.0	0.8	2.0	1.0	1.8	0.5	1.5	2.0		0-1	1-2	2-4	4+	
Metals (mg/kg)																							
Arsenic	<5	6	<5	<5	----	----	6	----	12	----	<5	<5	<5	----	----	<5	----	100					
Barium	20	120	160	60	----	----	100	----	70	----	100	40	100	----	----	110	----						
Beryllium	<1	2	<1	<1	----	----	1	----	<1	----	1	<1	<1	----	----	<1	----	60					
Cadmium	<50	1	<1	<1	----	----	<1	----	<1	----	<1	<1	<1	----	----	<1	----	20					
Chromium	<1	57	34	42	----	----	35	----	61	----	52	35	28	----	----	27	----	100(IV)					
Cobalt	2	13	3	5	----	----	7	----	5	----	11	3	7	----	----	7	----	100					
Copper	<2	45	21	30	----	----	43	----	33	----	46	20	45	----	----	61	----	6,000					
Lead	<5	18	10	10	----	----	12	----	13	----	17	12	14	----	----	23	----	300					
Manganese	<5	36	7	6	----	----	20	----	5	----	196	8	106	----	----	206	----	3,800					
Nickel	6	31	11	26	----	----	18	----	22	----	21	12	17	----	----	12	----	400					
Vanadium	<2	181	151	124	----	----	153	----	440	----	168	95	114	----	----	129	----						
Zinc	<5	26	6	8	----	----	19	----	8	----	26	7	20	----	----	28	----	400					
Mercury	<0.1	0.1	<0.1	<0.1	----	----	0.2	----	<0.1	----	<0.1	<0.1	0.1	----	----	0.1	----	40					
TPH (mg/kg)																							
C6 – C9 Fraction	<10	<10	46	25	<10	<10	<10	<10	<10	<10	<10	11	288	69	205	114	10						
C10 – C14 Fraction	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	440	60	260	170	<50						
C15 – C28 Fraction	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100						
C29 – C36 Fraction	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100						
C10 – C36 Fraction (sum)	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	440	60	260	170	<50						
TRH (mg/kg)																							
C6 – C10 Fraction	<10	<10	57	36	<10	<10	<10	<10	<10	<10	<10	19	416	99	301	171	15						
F1	<10	<10	57	32	<10	<10	<10	<10	<10	<10	<10	19	337	71	269	138	12		50	88	150	290	180
>C10 – C16 Fraction	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	210	<50	150	90	<50						
>C16 - C34 Fraction	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100						1300
>C34 - C40 Fraction	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100						5600
>C10 – C40 Fraction (sum)	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	210	<50	150	90	<50						
F2	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	200	<50	140	80	<50		280	NL	NL	NL	120
BTEXN (mg/kg)																							
Benzene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.6	0.3	<0.2	0.3	<0.2		0.7	1	2	3	65
Toluene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.3	4.3	<0.5	<0.5	<0.5		408	NL	NL	NL	105
Ethylbenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	13	3.2	4.2	5.3	<0.5		NL	NL	NL	NL	125
meta- & para-Xylene	<0.5	<0.5	<0.5	2.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	49.7	14.8	23.1	23.8	2.3						
ortho-Xylene	<0.5	<0.5	<0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	14.3	5	4.3	3.1	0.6						
Sum of BTEX	<0.5	<0.2	<0.2	3.9	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	78.9	27.6	31.6	32.5	2.9						
Total Xylenes	<0.2	<0.5	<0.5	3.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	64	19.8	27.4	26.9	2.9		110	310	NL	NL	45
Naphthalene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	8	3	8	5	<1		5	NL	NL	NL	
PAH																							
Sum of PAH	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	8.8	1.8	7.4	4.8	0.8	300					

Notes: *Bold indicates a value >LOR, shaded indicates an exceedance. Values for boron, selenium and phenolics omitted as they were <LOR. "B" = bowser sample, "F" = fuel line sample.* *Soil HIL for residential A, **Soil HSL for vapour intrusion, clay soil, residential ***Soil ESL for fine soil, "urban residential and public open space". Value for dry soil, used as a guide only.

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Table 3: Investigation 6th and 7th August 2020 – Delineate contamination around fuel lines and former bowser pad.

Date Samples Collected: 6 &7/8/2020 Lab No: EM2013917	Fuel A	Fuel B	B3	SB1-1.3m	SB1-1.5m	SB3-1.0m	SB5-1.0m	HIL-A*	HSL-A**			ESL***
Depth (mBGSL):	0.6	0.6	2.1	1.3	1.5	1.0	1.0		0-1	1-2	2-4	
Metals (mg/kg)												
Arsenic	-	<5	<5	6	<5	<5	6	100				
Barium	-	90	40	100	100	40	80					
Beryllium	-	1	<1	2	<1	<1	<1	60				
Cadmium	-	<1	<1	<1	<1	<1	<1	20				
Chromium	-	43	34	49	21	31	47	100(IV)				
Cobalt	-	8	4	11	4	2	7	100				
Copper	-	50	22	50	48	44	55	6,000				
Lead	-	11	14	16	22	12	15	300				
Manganese	-	36	15	84	58	8	7	3,800				
Nickel	-	18	12	21	8	8	16	400				
Vanadium	-	160	119	-	121	121	153					
Zinc	-	20	24	40	16	10	22	400				
Mercury	-	<0.1	<0.1	<0.1	0.1	0.3	0.2	40				
TPH (mg/kg)												
C6 – C9 Fraction	163	<10	57	<10	<10	-	-					
C10 – C14 Fraction	80	<50	<50	<50	<50	-	-					
C15 – C28 Fraction	<100	<100	<100	<100	<100	-	-					
C29 – C36 Fraction	<100	<100	<100	<100	<100	-	-					
C10 – C36 Fraction (sum)	80	<50	<50	<50	<50	-	-					
TRH (mg/kg)												
C6 – C10 Fraction	207	12	101	<10	<10	-	-					
F1	200	12	67	<10	<10	-	-		50	88	150	180
>C10 – C16 Fraction	50	<50	<50	<50	<50	-	-					
>C16 - C34 Fraction	<100	<100	<100	<100	<100	-	-					1300
>C34 - C40 Fraction	<100	<100	<100	<100	<100	-	-					5600
>C10 – C40 Fraction (sum)	50	<50	<50	<50	<50	-	-					
F2	<50	<50	<50	<50	<50	-	-		280	NL	NL	120
BTEXN (mg/kg)												
Benzene	<0.2	<0.2	1.1	<0.2	<0.2	-	-		0.7	1	2	65
Toluene	<0.5	<0.5	3.6	<0.5	<0.5	-	-		408	NL	NL	105
Ethylbenzene	3.4	0.5	3.6	<0.5	<0.5	-	-		NL	NL	NL	125
meta- & para-xylene	3.4	<0.5	19.4	<0.5	<0.5	-	-					
ortho-xylene	<0.5	<0.5	6.7	<0.5	<0.5	-	-					
Total xylenes	3.4	<0.5	26.1	<0.5	<0.5	-	-					45
Sum of BTEX	6.8	0.5	34.4	<0.2	<0.2	-	-		110	310	NL	
Naphthalene	1	<1	4	<1	<1	-	-		5	NL	NL	

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Table 4: Investigation 6th and 7th August 2020 – Delineated Contamination around fuel lines and former bowser pad.

Date Samples Collected: 6&7/8/2020 EM2012917	SB2 1.0	SB3 0.3	SB4 1.1	SB5 0.3	SB6 1.0	SB7 0.5	SB8 0.5	SB9 0.5	SB9 1.1	F3 0.45	F3 0.7	F3 1.1	HIL-A*	HSL-A**		ESL***
Depth (mBGSL):	1.0	0.3	1.1	0.3	1.0	0.5	0.5	0.5	1.1	0.45	0.7	1.1		0-1	1-2	
Metals (mg/kg)																
Arsenic	-	5	<5	<5	<5	5	<5	-	5	<5	6	<5	100			
Barium	-	90	70	150	40	90	110	-	90	60	80	40				
Beryllium	-	1	<1	1	<1	1	2	-	2	<1	2	<1	60			
Cadmium	-	1	<1	1	<1	<1	<1	-	<1	<1	<1	<1	20			
Chromium	-	68	24	78	40	44	72	-	46	31	52	42	100(IV)			
Cobalt	-	14	3	24	2	12	14	-	13	8	13	6	100			
Copper	-	57	34	26	32	45	38	-	46	22	48	46	6,000			
Lead	-	23	14	23	13	12	14	-	12	11	17	14	300			
Manganese	-	342	13	805	10	26	49	-	16	192	<5	7	3,800			
Nickel	-	18	11	19	8	20	27	-	24	14	21	10	400			
Vanadium	-	180	80	154	140	156	198	-	165	-	198	159				
Zinc	-	46	12	37	8	16	22	-	18	1,160	18	15	400			
Mercury	-	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	40			
TPH (mg/kg)																
C6 – C9 Fraction	<10	<10	<10	<10	<10	<10	<10	<10	<10	337	<10	<10				
C10 – C14 Fraction	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50				
C15 – C28 Fraction	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100				
C29 – C36 Fraction	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100				
C10 – C36 Fraction (sum)	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50				
TRH (mg/kg)																
C6 – C10 Fraction	11	<10	<10	<10	<10	<10	<10	<10	<10	463	<10	<10				
F1	11	<10	<10	<10	<10	<10	<10	<10	<10	463	<10	<10		50	88	150
>C10 – C16 Fraction	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50				
>C16 - C34 Fraction	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100				
>C34 - C40 Fraction	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100				
>C10 – C40 Fraction (sum)	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50				
F2	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		280	NL	NL
BTEXN (mg/kg)																
Benzene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		0.7	1	2
Toluene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		408	NL	NL
Ethylbenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		NL	NL	NL
meta- & para-Xylene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5				
ortho-Xylene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5				
Sum of BTEX	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2				
Total Xylenes	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		110	310	NL
Naphthalene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		5	NL	NL

Notes: *Samples which were a clay/sand mix or are of unknown consistency have been classified as sand which is the most conservative limit. Bold indicates a value >LOR, shaded indicates an exceedance. Values for boron, molybdenum, selenium, silver, tin, cyanide, OC pesticides, PAHs, and phenolics omitted as they were <LOR. "F" = fuel line sample.* *Soil HIL for residential A. **Soil HSL for vapour intrusion, CLAY soil, residential. ***Soil ESL for coarse soil, "urban residential and public open space"- value for dry soil, used as a guide only.

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Table 5: Samples collected during decommissioning of Fuel Line (south) on 26 August 2020

Date Samples Collected: 26/08/2020 Lab No FM2014779	26/08/2020	26/08/2020	26/08/2020	26/08/2020	26/08/2020	26/08/2020	HIL-A*	HSL-A**				ESL***
Depth (mBGSL):	V1-1.2m	V3-1.2m	V5-1.5m	V4-1.6m	V2-1.2m	V6-1.75m		0-1	1-2	2-4	4+	
Wall (W) or Base (B) Sample	W	W	B	B	W	B						
Metals (mg/kg)												
Arsenic	6	7	5	----	----	----	100					
Barium	70	70	50	----	----	----						
Beryllium	1	<1	<1	----	----	----	60					
Cadmium	<50	<50	<50	----	----	----	20					
Chromium	<1	<1	<1	----	----	----	100(IV)					
Cobalt	48	56	39	----	----	----	100					
Copper	5	6	4	----	----	----	6,000					
Lead	57	62	56	----	----	----	300					
Manganese	14	16	14	----	----	----	3,800					
Nickel	15	13	9	----	----	----	400					
Vanadium	17	16	11	----	----	----						
Zinc	<5	<5	<5	----	----	----	400					
Mercury	0.6	0.3	0.1	----	----	----	40					
TPH (mg/kg)												
C6 – C9 Fraction	18	129	24	<10	82	<10						
C10 – C14 Fraction	<50	100	<50	<50	80	<50						
C15 – C28 Fraction	<100	<100	<100	<100	<100	<100						
C29 – C36 Fraction	<100	<100	<100	<100	<100	<100						
C10 – C36 Fraction (sum)	<50	100	<50	<50	80	<50						
TRH (mg/kg)												
C6 – C10 Fraction	30	160	32	<10	103	12						
F1	30	156	28	<10	101	10		50	88	150	50	180
>C10 – C16 Fraction	<50	60	<50	<50	50	<50						
>C16 - C34 Fraction	<100	<100	<100	<100	<100	<100						1300
>C34 - C40 Fraction	<100	<100	<100	<100	<100	<100						5600
>C10 – C40 Fraction (sum)	<50	60	<50	<50	50	<50						
F2	<50	60	<50	<50	50	<50		280	NL	NL	280	120
BTEXN (mg/kg)												
Benzene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		0.7	1	2	0.7	65
Toluene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		408	NL	NL	408	105
Ethylbenzene	<0.5	2.9	1.3	<0.5	1.6	0.6		NL	NL	NL	NL	125
meta- & para-Xylene	<0.5	0.7	2.2	<0.5	<0.5	1.1						
ortho-Xylene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5						
Sum of BTEX	<0.5	0.7	2.2	<0.5	<0.5	1.1						
Total Xylenes	<0.2	3.6	3.5	<0.2	1.6	1.7		110	310	NL	110	45
Naphthalene	<1	1	<1	<1	<1	<1		5	NL	NL	5	
PAH												
Sum of PAH		1					300					

Notes: *Bold indicates a value >LOR, shaded indicates an exceedance.* *Soil HIL for residential A. **Soil HSL for vapour intrusion, CLAY soil, residential. Omitted results – all below the LOR.

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Table 6: Samples collected during decommissioning of fuel lines (north) and bowser pad 10 September 2020

Date Samples Collected: 10/09/2020 Lab No: EM2016058	V7-1.2	V8-0.6	V9-0.9	V10-0.8	V11-1.2	V12-1.2	V13-1.5	V14-Base 1.0	V15-1.2	HIL-A*	HSL-A**				ESL***
Depth (mBGSL):	1.2	0.6	0.9	0.8	1.2	1.2	1.5	1.0	1.2		0-1	1-2	2-4	4+	
Wall (W) or Base (B) Sample	W	W	W	W	W	W	B	B	B						
Metals (mg/kg)															
Arsenic	5	----	<5	----	5	----	<5	----	5	100					
Barium	60	----	60	----	100	----	60	----	100						
Beryllium	1	----	<1	----	<1	----	<1	----	1	60					
Cadmium	<50	----	<50	----	<50	----	<50	----	<50	20					
Chromium	<1	----	<1	----	<1	----	<1	----	<1	100(IV)					
Cobalt	47	----	37	----	38	----	31	----	51	100					
Copper	5	----	6	----	7	----	3	----	10	6,000					
Lead	58	----	46	----	57	----	37	----	55	300					
Manganese	16	----	13	----	16	----	15	----	15	3,800					
Nickel	13	----	21	----	16	----	<5	----	36	400					
Vanadium	15	----	18	----	16	----	10	----	24						
Zinc	<5	----	<5	----	<5	----	<5	----	<5	400					
Mercury	0.1	----	<0.1	----	<0.1	----	0.2	----	<0.1	40					
TPH (mg/kg)															
C6 – C9 Fraction	35	<10	<10	<10	<10	62	41	<10	66						
C10 – C14 Fraction	<50	<50	<50	<50	<50	50	<50	70	60						
C15 – C28 Fraction	<100	<100	<100	<100	<100	<100	<100	<100	<100						
C29 – C36 Fraction	<100	<100	<100	<100	<100	<100	<100	<100	<100						
C10 – C36 Fraction (sum)	<50	<50	<50	<50	<50	50	<50	70	60						
TRH (mg/kg)															
C6 – C10 Fraction	48	<10	<10	<10	<10	82	51	14	82						
F1	46	<10	<10	<10	<10	76	49	14	78		50	88	150	50	180
>C10 – C16 Fraction	<50	<50	<50	<50	<50	<50	<50	60	<50						
>C16 - C34 Fraction	<100	<100	<100	<100	<100	<100	<100	<100	<100						1300
>C34 - C40 Fraction	<100	<100	<100	<100	<100	<100	<100	<100	<100						5600
>C10 – C40 Fraction (sum)	<50	<50	<50	<50	<50	<50	<50	60	<50						
F2	<50	<50	<50	<50	<50	<50	<50	60	<50		280	NL	NL	280	120
BTEXN (mg/kg)															
Benzene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		0.7	1	2	0.7	65
Toluene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		408	NL	NL	408	105
Ethylbenzene	1.1	<0.5	<0.5	<0.5	<0.5	1.5	1	<0.5	0.8		NL	NL	NL	NL	125
meta- & para-Xylene	1.4	<0.5	<0.5	<0.5	<0.5	3.8	0.9	<0.5	3						
ortho-Xylene	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5						
Sum of BTEX	1.4	<0.5	<0.5	<0.5	<0.5	4.3	0.9	<0.5	3						
Total Xylenes	2.5	<0.2	<0.2	<0.2	<0.2	5.8	1.9	<0.2	3.8		110	310	NL	110	45
Naphthalene	2	<1	<1	<1	<1	1	<1	<1	<1		5	NL	NL	5	
PAH															
Sum of PAH	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	0.6	300					

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12.1 QAQC Laboratory

ALS produce a QC report with each certificate of analysis. They provide a laboratory duplicate (DUP), method blank (MB), laboratory control spike (LCS) and matrix spike (MS) report. The results of these reports are shown below in Table 8.

Figure 27: ALS QA/QC

ALS Report	*Date*	*DUP*	*MB*	*LCS*	*MS*
EM2008991	3/6/20	*	ok	ok	ok
EM2009595	11/6/20	**	ok	ok	ok
EM2012917	30/7/20	ok	ok	ok	ok
EM2013917	14/8/20	ok	ok	ok	ok

*S8 did not pass QA/QC for C6-C9 fraction, C6-C10 fraction and meta- and para-xylene as RPD exceeded LOR-based limit.

**Stockpile Check did not pass QA/QC for meta- and para-xylene analysis as RPD exceeded LOR-based limit.

QA outliers with S8 and Stockpile Check duplicates indicate the May-June tank wall sandy fill samples had low homogeneity.

12.2 QAQC Field

A field duplicate was taken during soil sampling in May and June. RPD limits were calculated using ALS Laboratory's LOR-based method so the lab and field duplicates can be comparable. RPD limit rules are given in Table 9. Tables 10 and 11 show field duplicate results. All parameters tested for the primary sample and duplicate were <LOR.

Figure 28: RPD Limits

Result	*RPD Limit*
< 10x LOR	No limit
10x-20x LOR	50%
> 20x LOR	20%

Figure 29: Duplicate Pair 1

Lab. Report No.	EM2008991				
Sample Details	LOR	Pair 1 - Soil		RPD	RPD Limit
		S4	S5		
Parameter		mg/kg			
All parameters tested*	-	<LOR	<LOR	N/A	N/A

*Not including surrogates.

Figure 30: Duplicate Pair 2

Lab. Report No.	EM2009595				
Sample Details	LOR	Pair 1 - Soil		RPD	RPD Limit
		S8 C	Dup		
Parameter		mg/kg			
All parameters tested*	-	<LOR	<LOR	N/A	N/A

*Not including surrogates.

13 Results

The tank decommissioning sampling showed low to moderate levels of hydrocarbon contamination around tank 2. Sample S8 was the only sample exceeding NEPM residential guidelines, with a value 115mg/kg above the health screening level for C6-C10 hydrocarbons (a hydrocarbon fraction associated with ULP). S8 was located on the western wall of pit 2, and therefore in the direction of the groundwater flow. Other samples from the tank 2 pit had elevated light hydrocarbons, lead and BTEXN, however, there was no soil contamination associated with tank 1.

The secondary sampling showed the soil below S8 to be <LOR for all hydrocarbons, indicating the hydrocarbon contamination around the walls of tank 2 was very localised. The infilled material had elevated light hydrocarbons and BTEXN but did not exceed NEPM guidelines.

Soil sampling in July:

July sampling revealed several exceedances. HSLs for F1 (B2 1.0, B3 0.5, B3 1.5), F2 (B3 0.5), naphthalene (B3 0.5), and ESLs for F2 (B2 1.0, B3 0.5), F2 (B2 1.0, B3 0.5) and xylenes (B2 1.0) were exceeded. Minor BTEXN and light hydrocarbons were found at Fuel 2 -3.0m, and minor F1 hydrocarbons at Fuel 2 - 2.0m. Soil underneath bowser 2 and 3 appears to be the most

contaminated area, with contamination decreasing with depth; there were no exceedances in the B2 1.8m sample or B3 2.0m sample. Some contamination exists at Fuel line 2, however, it does not exceed any guidelines.

Soil sampling in 6th and 7th August:

August sampling showed 'Fuel A' exceeded HSLs for F1 hydrocarbons at 0.6 mbgs, and 'Fuel 3' exceeded zinc and F1 hydrocarbon HSLs at 0.45m. As per July sampling, contamination at depth at Fuel 3 was low for zinc and <LOR for hydrocarbons, suggesting little to no lateral movement of contaminants. There was minor F1 contamination at Fuel B and SB1, minor BTEXN at Fuel A and Fuel B, minor mid and heavy hydrocarbons at Fuel A, and moderate F1, light hydrocarbon, BTEXN at B3. All other sample points had low or no contamination.

Removal of Fuel Lines 26 August and 10 September 2020:

Final pit samples collected on 26 August and 10 September 2020 revealed that two areas 'V3-1.2m' and 'V2-1.2m' remain non-compliant with HSLs for Residential A use in the southern eastern wall of the pit. Base samples confirmed that hydrocarbon concentrations had adequately reduced with depth from 1.5 to 1.75 mbgs in this southern pit.

All other pit samples which were collected after removal of contaminated soil comply with HSL-A for residential use. The results indicate residual concentrations of petroleum hydrocarbon compounds in remaining soils. It is likely that these F1 and TEXN compounds will reduce further over time and particularly since the pit was filled with porous rock which will allow for further aerobic attenuation of volatile compounds.

14 Conclusions and Recommendations

The decommissioning works of the underground tank and fuel lines were completed in stages between May and September 2020.

The fuel bowsers had previously been removed sometime prior to 2018 and there is no documentation of the removal.

Two underground tanks were removed on 26th May 2020. Further investigation was conducted to determine the location of fuel lines and additional tanks in July and August 2020. A ground penetrating radar was used to located three possible underground tanks under the footpath and road. The fuel lines up to the boundary /edge of the footpath were removed in August and September 2020 and contaminated soil from the pits were removed and stockpiled onsite and the remaining soils in the pit were validated.

All pit validation samples comply with the 'Residential – A' NEPASCM screening levels except for two pit wall samples 'V2-1.2m' and 'V3-1.2m'. These sample points were at 1.2 m and pose no dermal risk, they are isolated historic hotspots of F1 contamination that is within 1 order of the guidelines and so poses acceptable risk considering that vapour assessment of the slabs detected no vapour. Similar hotspots of F1 at Tank 2 were remediated to find no contamination as the F1 is very volatile. No further remediation is considered necessary and no impact on groundwater was detected.

Vapour sampling which was completed by ES&D under the two workshop slabs and beside the remediated pit did not detect any volatile compounds in the samples.

A Detailed Site Investigation Report including the vapour assessment results is currently being prepared by ES&D to meet council planning regulations.

The UPSS decommissioning assessment was completed in accordance with the Tas Bulletin EPA Guidance UPSS 1 & UPSS 2.

The decommissioning assessment has revealed that soils around the fuel lines and bowser pad contained low levels of petroleum hydrocarbons and that contaminated soils were removed from a final large pit of 19 m L x 2.5- 3.5W x 1.0-1.75m D. Validation samples were collected in the walls and base of the pit and all samples comply with Residential A NEPASCM HSLs with the except of two samples taken from the southern and eastern walls of the pit at 1.2 mbgs. The pit was backfilled with quarry rock.

It is recommended that the two isolated areas found to be above HSL-A are isolated hotspots that do not pose dermal or vapour risk (as per CSM) and further remediation is not required. Soil which is stockpiled on the site will be required to be tested against bulleting 105 and disposed of in accordance with the Waste Management Regulations 2020.

Rod Cooper

Principal Consultant and CEnvP Site Contamination Specialist.

Figure 31: Revised Conceptual Site Model

Contamination Source	COPC	Pathway	Receptor
Underground petroleum storage systems (UPSS)	• Heavy metals – unlikely, low lead levels • Aliphatic hydrocarbons • Aromatic hydrocarbons	Vapour inhalation of COPC in surface soils NO CONTAMIANTION	• Site users • Subsurface workers • Surrounding site users
	• Heavy metals – unlikely, low lead levels • Aliphatic hydrocarbons • Aromatic hydrocarbons	Dermal contact/ingestion of COPC in surface soils NO CONTAMIANTION	• Site users • Subsurface workers • Surrounding site users • Transitory wildlife - unlikely
	• Heavy metals – unlikely, low lead levels • Aliphatic hydrocarbons • Aromatic hydrocarbons	Migration into soil and groundwater and subsequent ingestion/dermal contact or inhalation of COPC NO CONTAMIANTION	• Site users • Subsurface workers • Surrounding site users • Transitory wildlife - unlikely • Murfettville - unlikely

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15 Limitations

ES&D has prepared this report in accordance with the care and thoroughness of the consulting profession for Carlton Frame. It was based on accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report. It is prepared in accordance with the scope of work and for the purpose outlined.

This report was prepared during June 2020 and is based on the conditions encountered and information reviewed at the time of preparation. ES&D disclaims the responsibility for any changes that may have occurred after this time.

This report should be read in full. No responsibility is accepted for any use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice.

Subsurface conditions can vary across a site and cannot be explicitly defined by these investigations. It is unlikely therefore that the results and estimations expressed in this report will represent the extreme conditions within the site.

The information in this report is accurate at the date of issue and is in accordance with conditions at the site at the dates sampled.

This document and the information contained herein should only be regarded as validly representing the site conditions at the time of the investigation unless otherwise explicitly stated in a preceding section of the report.

No warranty or guarantee of property conditions is given or intended.

References

CRC CARE TR10 - CRC Care Technical Report No. 10 "Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater" (September 2011)

EPA Tasmania Technical Guideline - UPSS1 - Decommissioning Report Requirements - v2 - June 2014

EPA Technical Guideline - Technical Guideline - UPSS2 - UPSS Decommissioning Assessment - Sampling and Risk Assessment Requirements - June 2014

National Environmental Protection (Assessment of Site Contamination) Measure, "Guideline on the Investigation Levels for Soil and Groundwater", Schedule B (1), 1999 (as amended 2013)

National Environmental Protection (Assessment of Site Contamination) Measure, "Guideline on Data Collection, Sample Design and Reporting", Schedule B (2), 1999 (as amended 2013)

AS 4482.1 (2005) Guide to the Sampling and Investigation of Potentially Contaminated Soil - Part 1: Non-Volatile and Semi Volatile Compounds

AS 4482.2 (1999) Guide to the Sampling and Investigation of Potentially Contaminated Soil – *Part 2: Volatile Substances*

AS 5667.1:1998, Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples

ALS Global - www.alsglobal.com/environmental/services/north-america-environmental-services/usa/petroleum-hydrocarbons.aspx

Tasmanian Government Land Information System - http:// www.thelist.tas.gov.au

EPA Tasmania Information Bulletin No. 105 – Classification and Management of Contaminated Soil for Disposal - November 2012

Department of Primary Industries, Parks, Water and Environment (DPIPWE) Groundwater Information Access Portal: http://wrt.tas.gov.au/groundwater-info/

Appendix 1 – ALS Certificates

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM2008991**	Page	: 1 of 6
Client	: ENVIRONMENTAL SERVICE AND DESIGN PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: MR ROD COOPER	Contact	: Shirley LeCornu
Address	: 80 MINNA ROAD PO BOX 651 HEYBRIDGE TASMANIA, AUSTRALIA 7316	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 03 6442 4037	Telephone	: +6138549 9630
Project	: 77 Main Road Cressy	Date Samples Received	: 28-May-2020 10:25
Order number	: ----	Date Analysis Commenced	: 01-Jun-2020
C-O-C number	: ----	Issue Date	: 03-Jun-2020 12:20
Sampler	: ROD COOPER		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 11		
No. of samples analysed	: 11		

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. 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*
Bronwyn Sheen	Assistant Laboratory Manager	Melbourne Inorganics, Springvale, VIC
Bronwyn Sheen	Assistant Laboratory Manager	Melbourne Organics, Springvale, VIC
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC

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General Comments

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

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

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

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

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

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

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

- EP080: Particular sample EM2008991_008 shows poor duplicate precision due to sample heterogeneity. Confirmed by re-analysis. Unable to confirm via re-extraction due to the compromising of volatile compounds by sample homogenisation.

1-422

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	S1	S2	S3	S4	S5
			Client sampling date / time	27-May-2020 10:14	27-May-2020 10:18	27-May-2020 10:20	27-May-2020 10:24	27-May-2020 11:00
Compound	CAS Number	LOR	Unit	EM2008991-001	EM2008991-002	EM2008991-003	EM2008991-004	EM2008991-005
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	19.3	19.5	23.1	16.6	17.5
EG005(ED093)T: Total Metals by ICP-AES								
Lead	7439-92-1	5	mg/kg	<5	<5	<5	<5	<5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
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
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
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
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	83.2	91.9	80.6	81.8	88.4
Toluene-D8	2037-26-5	0.2	%	77.9	84.3	72.5	75.6	80.6
4-Bromofluorobenzene	460-00-4	0.2	%	78.4	85.0	74.2	72.7	79.8

1-423

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	S6	S7	S8	S9	S10
				Client sampling date / time	27-May-2020 10:29	27-May-2020 10:41	27-May-2020 10:50	27-May-2020 10:55	27-May-2020 11:01
Compound	CAS Number	LOR	Unit		EM2008991-006	EM2008991-007	EM2008991-008	EM2008991-009	EM2008991-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		19.7	18.6	17.2	17.1	18.4
EG005(ED093)T: Total Metals by ICP-AES									
Lead	7439-92-1	5	mg/kg		<5	5	8	10	13
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	35	172	48	26
C10 - C14 Fraction	----	50	mg/kg		<50	<50	90	<50	90
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	90	<50	90
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	50	260	70	51
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	40	225	54	44
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	60	<50	70
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	60	<50	70
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	50	<50	70
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	2.1	1.0	0.6	2.2
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	0.8	3.1	1.1	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	5.2	24.9	10.7	3.4
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	1.6	6.3	3.6	1.2
^ Sum of BTEX	----	0.2	mg/kg		<0.2	9.7	35.3	16.0	6.8
^ Total Xylenes	----	0.5	mg/kg		<0.5	6.8	31.2	14.3	4.6
Naphthalene	91-20-3	1	mg/kg		<1	<1	7	<1	<1
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		83.4	81.8	79.6	79.3	83.4
Toluene-D8	2037-26-5	0.2	%		76.9	86.3	78.5	73.9	77.0
4-Bromofluorobenzene	460-00-4	0.2	%		77.5	97.2	92.4	76.0	80.2

1-424

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	S11	----	----	----	----
			Client sampling date / time	27-May-2020 11:07	----	----	----	----
Compound	CAS Number	LOR	Unit	EM2008991-011	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	16.3	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Lead	7439-92-1	5	mg/kg	9	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	18	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	32	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	29	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	----	----	----
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	2.4	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	0.7	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	3.1	----	----	----	----
^ Total Xylenes	----	0.5	mg/kg	3.1	----	----	----	----
Naphthalene	91-20-3	1	mg/kg	1	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	88.9	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	101	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	113	----	----	----	----

1-425

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124

1-426

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM2009595**	Page	: 1 of 4
Client	: ENVIRONMENTAL SERVICE AND DESIGN PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: MR ROD COOPER	Contact	: Shirley LeCornu
Address	: 80 MINNA ROAD PO BOX 651 HEYBRIDGE TASMANIA, AUSTRALIA 7316	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 03 6442 4037	Telephone	: +6138549 9630
Project	: 7186	Date Samples Received	: 05-Jun-2020 10:40
Order number	: ----	Date Analysis Commenced	: 09-Jun-2020
C-O-C number	: ----	Issue Date	: 11-Jun-2020 16:39
Sampler	: ROD COOPER		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. 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*
Arenie Vijayaratnam	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC

1-427

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.

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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.

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^ = 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: Particular sample EM2009595_01 shows poor duplicate precision due to sample heterogeneity. Confirmed by re-analysis. Unable to confirm via re-extraction due to the compromising of volatile compounds by sample homogenisation.

1-428

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	STOCKPILE CHECK	S8 CHECK	DUPLICATE	----	----
				Client sampling date / time	03-Jun-2020 10:00	03-Jun-2020 10:05	03-Jun-2020 10:00	----	----
					EM2009595-001	EM2009595-002	EM2009595-003	--------	--------
					Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		19.9	11.6	10.1	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		39	<10	<10	----	----
C10 - C14 Fraction	----	50	mg/kg		80	<50	<50	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		80	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		61	<10	<10	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		52	<10	<10	----	----
>C10 - C16 Fraction	----	50	mg/kg		70	<50	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		70	<50	<50	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		70	<50	<50	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		6.4	<0.5	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		2.2	<0.5	<0.5	----	----
^ Sum of BTEX	----	0.2	mg/kg		8.6	<0.2	<0.2	----	----
^ Total Xylenes	----	0.5	mg/kg		8.6	<0.5	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		70.2	94.8	74.6	----	----
Toluene-D8	2037-26-5	0.2	%		75.2	97.2	74.7	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		79.0	104	80.0	----	----

1-429

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM2013917**	Page	: 1 of 18
Client	: **ENVIRONMENTAL SERVICE AND DESIGN PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: CARMEL PARKER	Contact	: Shirley LeCornu
Address	: 80 MINNA ROAD PO BOX 651 HEYBRIDGE TASMANIA, AUSTRALIA 7316	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9630
Project	: 7186	Date Samples Received	: 12-Aug-2020 09:10
Order number	: 7186	Date Analysis Commenced	: 13-Aug-2020
C-O-C number	: ----	Issue Date	: 14-Aug-2020 22:01
Sampler	: CARMEL PARKER		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 20		
No. of samples analysed	: 19		

Accreditation No. 825
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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*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC

1-431

General Comments

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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: Positive TRH band in sample EM2013917_18 due to substituted alkane. Results have been confirmed by re-analysis.
- EP071: Sample EM2013917_18 TRH results have been confirmed by re-extraction and re-analysis.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Fuel A-0.6m	Fuel B-0.6m	Bowser 3-2.1m	SB1-1.3m	SB1-1.5m
				Client sampling date / time	06-Aug-2020 13:27	06-Aug-2020 13:45	06-Aug-2020 15:28	06-Aug-2020 16:30	06-Aug-2020 16:03
Compound	CAS Number	LOR	Unit		EM2013917-001	EM2013917-002	EM2013917-004	EM2013917-005	EM2013917-006
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		30.3	31.2	26.6	30.8	20.9
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		----	<5	<5	6	<5
Barium	7440-39-3	10	mg/kg		----	90	40	100	100
Beryllium	7440-41-7	1	mg/kg		----	1	<1	2	<1
Boron	7440-42-8	50	mg/kg		----	<50	<50	----	<50
Cadmium	7440-43-9	1	mg/kg		----	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		----	43	34	49	21
Cobalt	7440-48-4	2	mg/kg		----	8	4	11	4
Copper	7440-50-8	5	mg/kg		----	50	22	50	48
Lead	7439-92-1	5	mg/kg		----	11	14	16	22
Manganese	7439-96-5	5	mg/kg		----	36	15	84	58
Molybdenum	7439-98-7	2	mg/kg		----	<2	<2	<2	----
Nickel	7440-02-0	2	mg/kg		----	18	12	21	8
Selenium	7782-49-2	5	mg/kg		----	<5	<5	<5	<5
Silver	7440-22-4	2	mg/kg		----	<2	<2	<2	----
Tin	7440-31-5	5	mg/kg		----	<5	<5	<5	----
Vanadium	7440-62-2	5	mg/kg		----	160	119	----	121
Zinc	7440-66-6	5	mg/kg		----	20	24	40	16
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		----	<0.1	<0.1	<0.1	0.1
EG048: Hexavalent Chromium (Alkaline Digest)									
Hexavalent Chromium	18540-29-9	0.5	mg/kg		----	<0.5	<0.5	<0.5	----
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	1	mg/kg		----	<1	<1	<1	----
EK040T: Fluoride Total									
Fluoride	16984-48-8	40	mg/kg		----	160	140	190	----
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		----	<0.1	<0.1	<0.1	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		----	<0.05	<0.05	<0.05	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		----	<0.05	<0.05	<0.05	----
beta-BHC	319-85-7	0.05	mg/kg		----	<0.05	<0.05	<0.05	----
gamma-BHC	58-89-9	0.05	mg/kg		----	<0.05	<0.05	<0.05	----

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Fuel A-0.6m	Fuel B-0.6m	Bowser 3-2.1m	SB1-1.3m	SB1-1.5m
				Client sampling date / time	06-Aug-2020 13:27	06-Aug-2020 13:45	06-Aug-2020 15:28	06-Aug-2020 16:30	06-Aug-2020 16:03
Compound	CAS Number	LOR	Unit		EM2013917-001	EM2013917-002	EM2013917-004	EM2013917-005	EM2013917-006
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
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	----
^ 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	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		----	<0.5	<0.5	<0.5	----
2-Chlorophenol	95-57-8	0.5	mg/kg		----	<0.5	<0.5	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg		----	<0.5	<0.5	<0.5	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg		----	<1	<1	<1	----
2-Nitrophenol	88-75-5	0.5	mg/kg		----	<0.5	<0.5	<0.5	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		----	<0.5	<0.5	<0.5	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		----	<0.5	<0.5	<0.5	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		----	<0.5	<0.5	<0.5	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		----	<0.5	<0.5	<0.5	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		----	<0.5	<0.5	<0.5	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		----	<0.5	<0.5	<0.5	----
Pentachlorophenol	87-86-5	2	mg/kg		----	<2	<2	<2	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Fuel A-0.6m	Fuel B-0.6m	Bowser 3-2.1m	SB1-1.3m	SB1-1.5m
				Client sampling date / time	06-Aug-2020 13:27	06-Aug-2020 13:45	06-Aug-2020 15:28	06-Aug-2020 16:30	06-Aug-2020 16:03
Compound	CAS Number	LOR	Unit		EM2013917-001	EM2013917-002	EM2013917-004	EM2013917-005	EM2013917-006
					Result	Result	Result	Result	Result
EP075(SIM)A: Phenolic Compounds - Continued									
^ Sum of Phenols	----	0.5	mg/kg		----	<0.5	<0.5	<0.5	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		0.6	0.6	0.6	0.6	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	1.2	1.2	1.2	----
EP075B: Polynuclear Aromatic Hydrocarbons									
Benzo(a)pyrene	50-32-8	0.05	mg/kg		----	<0.05	<0.05	<0.05	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		163	<10	57	<10	<10
C10 - C14 Fraction	----	50	mg/kg		80	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		80	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		207	12	101	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		200	12	67	<10	<10

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Fuel A-0.6m	Fuel B-0.6m	Bowser 3-2.1m	SB1-1.3m	SB1-1.5m
				Client sampling date / time	06-Aug-2020 13:27	06-Aug-2020 13:45	06-Aug-2020 15:28	06-Aug-2020 16:30	06-Aug-2020 16:03
Compound	CAS Number	LOR	Unit		EM2013917-001	EM2013917-002	EM2013917-004	EM2013917-005	EM2013917-006
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C10 - C16 Fraction	----	50	mg/kg		50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	1.1	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	3.6	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		3.4	0.5	3.6	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		3.4	<0.5	19.4	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	6.7	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		6.8	0.5	34.4	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		3.4	<0.5	26.1	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		1	<1	4	<1	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		----	91.1	94.3	91.1	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	115	106	97.1	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	87.5	81.2	78.8	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		90.8	95.4	103	91.1	----
2-Chlorophenol-D4	93951-73-6	0.5	%		87.4	89.8	94.6	87.5	----
2.4.6-Tribromophenol	118-79-6	0.5	%		69.6	73.9	74.2	66.3	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		99.5	102	109	98.5	----
Anthracene-d10	1719-06-8	0.5	%		107	110	116	109	----
4-Terphenyl-d14	1718-51-0	0.5	%		88.6	91.4	95.8	88.4	----
EP075T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.025	%		----	102	112	107	----
Anthracene-d10	1719-06-8	0.025	%		----	86.7	96.0	92.7	----
4-Terphenyl-d14	1718-51-0	0.025	%		----	83.0	90.8	87.8	----
EP080S: TPH(V)/BTEX Surrogates									

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Fuel A-0.6m	Fuel B-0.6m	Bowser 3-2.1m	SB1-1.3m	SB1-1.5m
				Client sampling date / time	06-Aug-2020 13:27	06-Aug-2020 13:45	06-Aug-2020 15:28	06-Aug-2020 16:30	06-Aug-2020 16:03
Compound	CAS Number	LOR	Unit		EM2013917-001	EM2013917-002	EM2013917-004	EM2013917-005	EM2013917-006
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		59.3	83.8	85.1	85.5	82.7
Toluene-D8	2037-26-5	0.2	%		70.8	86.6	82.4	80.7	84.1
4-Bromofluorobenzene	460-00-4	0.2	%		68.9	91.0	89.5	87.9	91.0

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	SB2-1.0m	SB4-1.1m	SB3-1.0m	SB5-0.3m	SB5-1.0m
			Client sampling date / time	07-Aug-2020 10:08	07-Aug-2020 10:20	07-Aug-2020 10:33	07-Aug-2020 10:55	07-Aug-2020 11:05
Compound	CAS Number	LOR	Unit	EM2013917-007	EM2013917-008	EM2013917-009	EM2013917-010	EM2013917-011
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	----	27.7	28.8	21.2	29.8
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	<5	<5	<5	6
Barium	7440-39-3	10	mg/kg	----	70	40	150	80
Beryllium	7440-41-7	1	mg/kg	----	<1	<1	1	<1
Boron	7440-42-8	50	mg/kg	----	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg	----	<1	<1	1	<1
Chromium	7440-47-3	2	mg/kg	----	24	31	78	47
Cobalt	7440-48-4	2	mg/kg	----	3	2	24	7
Copper	7440-50-8	5	mg/kg	----	34	44	26	55
Lead	7439-92-1	5	mg/kg	----	14	12	23	15
Manganese	7439-96-5	5	mg/kg	----	13	8	805	7
Nickel	7440-02-0	2	mg/kg	----	11	8	19	16
Selenium	7782-49-2	5	mg/kg	----	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	----	80	121	154	153
Zinc	7440-66-6	5	mg/kg	----	12	10	37	22
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	<0.1	0.3	<0.1	0.2
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	<10	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	<50	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	----	<100	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	----	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	----	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	11	<10	----	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	11	<10	----	<10	----
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	----	<50	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	----	<100	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	<100	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	----	<50	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	----	<50	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB2-1.0m	SB4-1.1m	SB3-1.0m	SB5-0.3m	SB5-1.0m
				Client sampling date / time	07-Aug-2020 10:08	07-Aug-2020 10:20	07-Aug-2020 10:33	07-Aug-2020 10:55	07-Aug-2020 11:05
Compound	CAS Number	LOR	Unit		EM2013917-007	EM2013917-008	EM2013917-009	EM2013917-010	EM2013917-011
					Result	Result	Result	Result	Result
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	----	<0.2	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	----	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	----	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	----	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	----	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	----	<0.2	----
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	----	<0.5	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	----	<1	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		82.9	67.9	----	83.7	----
Toluene-D8	2037-26-5	0.2	%		91.9	71.7	----	84.8	----
4-Bromofluorobenzene	460-00-4	0.2	%		91.6	83.9	----	90.7	----

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB6-1.0m	SB7-0.5m	SB8-0.5m	SB9-0.5MB	SB9-1.1m
				Client sampling date / time	07-Aug-2020 10:23	07-Aug-2020 11:30	07-Aug-2020 11:40	07-Aug-2020 11:54	07-Aug-2020 11:58
Compound	CAS Number	LOR	Unit		EM2013917-012	EM2013917-013	EM2013917-014	EM2013917-016	EM2013917-017
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		----	----	----	30.5	----
Moisture Content	----	1.0	%		30.1	30.7	28.4	----	31.7
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	5	<5	----	5
Barium	7440-39-3	10	mg/kg		40	90	110	----	90
Beryllium	7440-41-7	1	mg/kg		<1	1	2	----	2
Boron	7440-42-8	50	mg/kg		<50	<50	<50	----	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	----	<1
Chromium	7440-47-3	2	mg/kg		40	44	72	----	46
Cobalt	7440-48-4	2	mg/kg		2	12	14	----	13
Copper	7440-50-8	5	mg/kg		32	45	38	----	46
Lead	7439-92-1	5	mg/kg		13	12	14	----	12
Manganese	7439-96-5	5	mg/kg		10	26	49	----	16
Nickel	7440-02-0	2	mg/kg		8	20	27	----	24
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	----	<5
Vanadium	7440-62-2	5	mg/kg		140	156	198	----	165
Zinc	7440-66-6	5	mg/kg		8	16	22	----	18
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	0.1	<0.1	----	<0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Fluorene	86-73-7	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Anthracene	120-12-7	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Pyrene	129-00-0	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Chrysene	218-01-9	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		----	<0.5	<0.5	----	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB6-1.0m	SB7-0.5m	SB8-0.5m	SB9-0.5MB	SB9-1.1m
				Client sampling date / time	07-Aug-2020 10:23	07-Aug-2020 11:30	07-Aug-2020 11:40	07-Aug-2020 11:54	07-Aug-2020 11:58
Compound	CAS Number	LOR	Unit		EM2013917-012	EM2013917-013	EM2013917-014	EM2013917-016	EM2013917-017
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		----	0.6	0.6	----	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		----	1.2	1.2	----	1.2
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
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
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
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
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	98.3	91.1	----	94.1
2-Chlorophenol-D4	93951-73-6	0.5	%		----	91.3	86.5	----	87.3

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB6-1.0m	SB7-0.5m	SB8-0.5m	SB9-0.5MB	SB9-1.1m
				Client sampling date / time	07-Aug-2020 10:23	07-Aug-2020 11:30	07-Aug-2020 11:40	07-Aug-2020 11:54	07-Aug-2020 11:58
Compound	CAS Number	LOR	Unit		EM2013917-012	EM2013917-013	EM2013917-014	EM2013917-016	EM2013917-017
					Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
2.4.6-Tribromophenol	118-79-6	0.5	%		----	68.1	65.5	----	65.8
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	102	97.1	----	96.4
Anthracene-d10	1719-06-8	0.5	%		----	112	110	----	106
4-Terphenyl-d14	1718-51-0	0.5	%		----	91.0	88.0	----	86.9
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		89.2	81.8	80.5	88.2	86.6
Toluene-D8	2037-26-5	0.2	%		89.5	83.6	75.4	84.2	81.3
4-Bromofluorobenzene	460-00-4	0.2	%		95.3	86.6	81.2	91.2	83.4

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	F3-0.45m	F3-0.7m	F3-1.1m	SB3-0.3m	----
			Client sampling date / time	07-Aug-2020 12:23	07-Aug-2020 12:24	07-Aug-2020 12:37	07-Aug-2020 10:35	----
Compound	CAS Number	LOR	Unit	EM2013917-018	EM2013917-019	EM2013917-020	EM2013917-021	--------
				Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	16.0	31.7	29.0	27.6	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	6	<5	5	----
Barium	7440-39-3	10	mg/kg	60	80	40	90	----
Beryllium	7440-41-7	1	mg/kg	<1	2	<1	1	----
Boron	7440-42-8	50	mg/kg	----	<50	<50	<50	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	1	----
Chromium	7440-47-3	2	mg/kg	31	52	42	68	----
Cobalt	7440-48-4	2	mg/kg	8	13	6	14	----
Copper	7440-50-8	5	mg/kg	22	48	46	57	----
Lead	7439-92-1	5	mg/kg	11	17	14	23	----
Manganese	7439-96-5	5	mg/kg	192	<5	7	342	----
Molybdenum	7439-98-7	2	mg/kg	<2	----	----	----	----
Nickel	7440-02-0	2	mg/kg	14	21	10	18	----
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	----
Silver	7440-22-4	2	mg/kg	<2	----	----	----	----
Tin	7440-31-5	5	mg/kg	<5	----	----	----	----
Vanadium	7440-62-2	5	mg/kg	----	198	159	180	----
Zinc	7440-66-6	5	mg/kg	1160	18	15	46	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	----
EG048: Hexavalent Chromium (Alkaline Digest)								
Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	1	mg/kg	<1	----	----	----	----
EK040T: Fluoride Total								
Fluoride	16984-48-8	40	mg/kg	120	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	F3-0.45m	F3-0.7m	F3-1.1m	SB3-0.3m	----
				Client sampling date / time	07-Aug-2020 12:23	07-Aug-2020 12:24	07-Aug-2020 12:37	07-Aug-2020 10:35	----
Compound	CAS Number	LOR	Unit		EM2013917-018	EM2013917-019	EM2013917-020	EM2013917-021	--------
					Result	Result	Result	Result	----
EP068A: Organochlorine Pesticides (OC) - Continued									
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	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	----	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.05	mg/kg		<0.05	----	----	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	----	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	----	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	----	----	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg		<1	----	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	----	----	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	----	----	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	----	----	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		<0.5	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	----	----	----	----
Pentachlorophenol	87-86-5	2	mg/kg		<2	----	----	----	----

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	F3-0.45m	F3-0.7m	F3-1.1m	SB3-0.3m	----
				Client sampling date / time	07-Aug-2020 12:23	07-Aug-2020 12:24	07-Aug-2020 12:37	07-Aug-2020 10:35	----
Compound	CAS Number	LOR	Unit		EM2013917-018	EM2013917-019	EM2013917-020	EM2013917-021	--------
					Result	Result	Result	Result	----
EP075(SIM)A: Phenolic Compounds - Continued									
^ Sum of Phenols	----	0.5	mg/kg		<0.5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		0.6	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	----	----	----	----
EP075B: Polynuclear Aromatic Hydrocarbons									
Benzo(a)pyrene	50-32-8	0.05	mg/kg		<0.05	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		337	<10	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		463	<10	<10	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		463	<10	<10	<10	----
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	----

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	F3-0.45m	F3-0.7m	F3-1.1m	SB3-0.3m	----
				Client sampling date / time	07-Aug-2020 12:23	07-Aug-2020 12:24	07-Aug-2020 12:37	07-Aug-2020 10:35	----
Compound	CAS Number	LOR	Unit		EM2013917-018	EM2013917-019	EM2013917-020	EM2013917-021	--------
					Result	Result	Result	Result	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg		<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	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	----
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		87.4	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		93.7	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		77.7	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		85.8	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		81.8	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		62.6	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		93.6	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		101	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		83.0	----	----	----	----
EP075T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.025	%		102	----	----	----	----
Anthracene-d10	1719-06-8	0.025	%		89.7	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.025	%		84.7	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		73.5	83.6	84.8	82.9	----

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	F3-0.45m	F3-0.7m	F3-1.1m	SB3-0.3m	----
				Client sampling date / time	07-Aug-2020 12:23	07-Aug-2020 12:24	07-Aug-2020 12:37	07-Aug-2020 10:35	----
Compound	CAS Number	LOR	Unit		EM2013917-018	EM2013917-019	EM2013917-020	EM2013917-021	--------
					Result	Result	Result	Result	----
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	0.2	%		87.8	83.1	80.7	79.3	----
4-Bromofluorobenzene	460-00-4	0.2	%		85.2	88.1	86.0	85.5	----

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Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	36	140
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	38	128
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	33	139
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	54	125
2-Chlorophenol-D4	93951-73-6	65	123
2.4.6-Tribromophenol	118-79-6	34	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	61	125
Anthracene-d10	1719-06-8	62	130
4-Terphenyl-d14	1718-51-0	67	133
EP075T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	35	126
Anthracene-d10	1719-06-8	40	135
4-Terphenyl-d14	1718-51-0	42	133
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2028276**	Page	: 1 of 4
Client	: ENVIRONMENTAL SERVICE AND DESIGN PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: CARMEL PARKER	Contact	: Shirley LeCornu
Address	: 91 TERRA NOVA DRIVE WYNYARD TASMANIA 7325	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +6138549 9630
Project	: 7186	Date Samples Received	: 13-Aug-2020 11:00
Order number	: 7186	Date Analysis Commenced	: 17-Aug-2020
C-O-C number	: ----	Issue Date	: 20-Aug-2020 14:52
Sampler	: CARMEL PARKER		
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. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

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General Comments

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

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

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

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

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

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

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

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.

1-450

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB9-0.5MA	----	----	----	----
				Client sampling date / time	07-Aug-2020 11:54	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2028276-001	--------	--------	--------	--------
					Result	---	---	---	---
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		29.7	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	----	----	----	----
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	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	----	----	----	----
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	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		89.4	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		80.6	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		89.0	----	----	----	----

1-451

Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%) Low	High
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM2014779**	Page	: 1 of 8
Client	: **ENVIRONMENTAL SERVICE AND DESIGN PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: CARMEL PARKER	Contact	: Shirley LeCornu
Address	: 80 MINNA ROAD PO BOX 651 HEYBRIDGE TASMANIA, AUSTRALIA 7316	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9630
Project	: 7186	Date Samples Received	: 27-Aug-2020 09:45
Order number	: 7186	Date Analysis Commenced	: 27-Aug-2020
C-O-C number	: ----	Issue Date	: 31-Aug-2020 11:33
Sampler	: CARMEL PARKER		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 6		
No. of samples analysed	: 6		

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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*
Nancy Wang	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Melbourne Inorganics, Springvale, VIC

1-453

General Comments

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

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

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

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

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

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

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

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- 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: Particular sample EM2014779_01 shows positive hits. Confirmed by re-analysis.

1-454

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	V1-1.2m	V2-1.2m	V3-1.2m	V4-1.6m	V5-1.5m
				Client sampling date / time	26-Aug-2020 15:31	26-Aug-2020 15:31	26-Aug-2020 15:31	26-Aug-2020 15:31	26-Aug-2020 15:31
Compound	CAS Number	LOR	Unit		EM2014779-001	EM2014779-002	EM2014779-003	EM2014779-004	EM2014779-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		----	30.0	----	28.5	----
Moisture Content	----	1.0	%		33.0	----	31.2	----	26.4
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		6	----	7	----	5
Barium	7440-39-3	10	mg/kg		70	----	70	----	50
Beryllium	7440-41-7	1	mg/kg		1	----	<1	----	<1
Boron	7440-42-8	50	mg/kg		<50	----	<50	----	<50
Cadmium	7440-43-9	1	mg/kg		<1	----	<1	----	<1
Chromium	7440-47-3	2	mg/kg		48	----	56	----	39
Cobalt	7440-48-4	2	mg/kg		5	----	6	----	4
Copper	7440-50-8	5	mg/kg		57	----	62	----	56
Lead	7439-92-1	5	mg/kg		14	----	16	----	14
Manganese	7439-96-5	5	mg/kg		15	----	13	----	9
Nickel	7440-02-0	2	mg/kg		17	----	16	----	11
Selenium	7782-49-2	5	mg/kg		<5	----	<5	----	<5
Vanadium	7440-62-2	5	mg/kg		179	----	202	----	138
Zinc	7440-66-6	5	mg/kg		19	----	23	----	18
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		0.6	----	0.3	----	0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	1.0	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	<0.5	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	----	<0.5	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	----	<0.5	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	<0.5	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	----	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	<0.5	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	V1-1.2m	V2-1.2m	V3-1.2m	V4-1.6m	V5-1.5m
				Client sampling date / time	26-Aug-2020 15:31	26-Aug-2020 15:31	26-Aug-2020 15:31	26-Aug-2020 15:31	26-Aug-2020 15:31
Compound	CAS Number	LOR	Unit		EM2014779-001	EM2014779-002	EM2014779-003	EM2014779-004	EM2014779-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	<0.5	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	<0.5	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	----	1.0	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	----	<0.5	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		0.6	----	0.6	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	----	1.2	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		18	82	129	<10	24
C10 - C14 Fraction	----	50	mg/kg		<50	80	100	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	80	100	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		30	103	160	<10	32
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		30	101	156	<10	28
>C10 - C16 Fraction	----	50	mg/kg		<50	50	60	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	50	60	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	50	60	<50	<50
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	1.6	2.9	<0.5	1.3
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	0.7	<0.5	2.2
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	1.6	3.6	<0.2	3.5
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	0.7	<0.5	2.2
Naphthalene	91-20-3	1	mg/kg		<1	<1	1	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		84.8	----	85.5	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		84.0	----	84.7	----	----

1-456

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	V1-1.2m	V2-1.2m	V3-1.2m	V4-1.6m	V5-1.5m
				Client sampling date / time	26-Aug-2020 15:31	26-Aug-2020 15:31	26-Aug-2020 15:31	26-Aug-2020 15:31	26-Aug-2020 15:31
Compound	CAS Number	LOR	Unit		EM2014779-001	EM2014779-002	EM2014779-003	EM2014779-004	EM2014779-005
					Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
2.4.6-Tribromophenol	118-79-6	0.5	%		76.1	----	73.8	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		101	----	102	----	----
Anthracene-d10	1719-06-8	0.5	%		106	----	105	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		91.3	----	89.7	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		85.5	84.3	80.5	96.2	97.4
Toluene-D8	2037-26-5	0.2	%		83.7	86.7	93.4	88.0	90.4
4-Bromofluorobenzene	460-00-4	0.2	%		89.3	83.7	90.7	91.2	89.2

1-457

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	V6-1.75m	----	----	----	----
			Client sampling date / time	26-Aug-2020 15:31	----	----	----	----
Compound	CAS Number	LOR	Unit	EM2014779-006	----------	----------	----------	----------
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	27.4	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	12	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	----	----	----	----

1-458

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	V6-1.75m	----	----	----	----
				Client sampling date / time	26-Aug-2020 15:31	----	----	----	----
Compound	CAS Number	LOR	Unit	EM2014779-006	----------	----------	----------	----------	
				Result	----	----	----	----	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	----	----	----	
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	0.6	----	----	----	----	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	1.1	----	----	----	----	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	----	----	
^ Sum of BTEX	----	0.2	mg/kg	1.7	----	----	----	----	
^ Total Xylenes	----	0.5	mg/kg	1.1	----	----	----	----	
Naphthalene	91-20-3	1	mg/kg	<1	----	----	----	----	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%	79.8	----	----	----	----	
2-Chlorophenol-D4	93951-73-6	0.5	%	82.1	----	----	----	----	
2.4.6-Tribromophenol	118-79-6	0.5	%	71.9	----	----	----	----	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%	101	----	----	----	----	
Anthracene-d10	1719-06-8	0.5	%	106	----	----	----	----	
4-Terphenyl-d14	1718-51-0	0.5	%	90.3	----	----	----	----	
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%	101	----	----	----	----	
Toluene-D8	2037-26-5	0.2	%	89.9	----	----	----	----	
4-Bromofluorobenzene	460-00-4	0.2	%	88.1	----	----	----	----	

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Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	54	125
2-Chlorophenol-D4	93951-73-6	65	123
2.4.6-Tribromophenol	118-79-6	34	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	61	125
Anthracene-d10	1719-06-8	62	130
4-Terphenyl-d14	1718-51-0	67	133
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124

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Appendix 1 – Laboratory Certificates

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2025938**	Page	: 1 of 6
Client	: **ENVIRONMENTAL SERVICE AND DESIGN PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: CARMEL PARKER	Contact	: Shirley LeCornu
Address	: Level 1 49-51 Elizabeth Street Launceston 7250	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +6138549 9630
Project	: 7186	Date Samples Received	: 28-Jul-2020 13:00
Order number	: 7186	Date Analysis Commenced	: 29-Jul-2020
C-O-C number	: ----	Issue Date	: 04-Aug-2020 15:35
Sampler	: CARMEL PARKER		
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. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

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General Comments

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

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

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

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

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

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

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

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

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Fuel 2-3.OB	----	----	----	----
				Client sampling date / time	20-Jul-2020 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2025938-001	----------	----------	----------	----------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		27.2	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	----	----	----	----
Barium	7440-39-3	10	mg/kg		50	----	----	----	----
Beryllium	7440-41-7	1	mg/kg		<1	----	----	----	----
Boron	7440-42-8	50	mg/kg		<50	----	----	----	----
Cadmium	7440-43-9	1	mg/kg		<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg		40	----	----	----	----
Cobalt	7440-48-4	2	mg/kg		4	----	----	----	----
Copper	7440-50-8	5	mg/kg		28	----	----	----	----
Lead	7439-92-1	5	mg/kg		10	----	----	----	----
Manganese	7439-96-5	5	mg/kg		5	----	----	----	----
Nickel	7440-02-0	2	mg/kg		25	----	----	----	----
Selenium	7782-49-2	5	mg/kg		6	----	----	----	----
Vanadium	7440-62-2	5	mg/kg		87	----	----	----	----
Zinc	7440-66-6	5	mg/kg		7	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	----	----	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	----	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	----	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	----	----	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg		<1	----	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	----	----	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	----	----	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	----	----	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		<0.5	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	----	----	----	----
Pentachlorophenol	87-86-5	2	mg/kg		<2	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		0.6	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	----	----	----

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Fuel 2-3.OB	----	----	----	----
				Client sampling date / time	20-Jul-2020 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2025938-001	-------	-------	-------	-------
					Result	---	---	---	---
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		0.6	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		0.6	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		54	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		82	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		79	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	----	----	----	----
EP080: BTEXN									

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Fuel 2-3.OB	----	----	----	----
				Client sampling date / time	20-Jul-2020 00:00	---	---	---	---
Compound	CAS Number	LOR	Unit		ES2025938-001	--------	--------	--------	--------
					Result	---	---	---	---
EP080: BTEXN - Continued									
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		1.8	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		0.9	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		2.7	----	----	----	----
^ Total Xylenes	----	0.5	mg/kg		2.7	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		1	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		83.9	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		89.1	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		69.5	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		94.1	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		102	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		91.2	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		110	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		118	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		118	----	----	----	----

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Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

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ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM2016058**	Page	: 1 of 9
Client	: ENVIRONMENTAL SERVICE AND DESIGN PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: CARMEL PARKER	Contact	: Shirley LeCornu
Address	: 80 MINNA ROAD PO BOX 651 HEYBRIDGE TASMANIA, AUSTRALIA 7316	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9630
Project	: 7186	Date Samples Received	: 15-Sep-2020 11:30
Order number	: 7186	Date Analysis Commenced	: 18-Sep-2020
C-O-C number	: ----	Issue Date	: 21-Sep-2020 14:06
Sampler	: CP		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 10		
No. of samples analysed	: 10		

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. 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*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

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General Comments

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

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

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

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

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

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

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

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

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	V7-1.2	V8-0.6	V9-0.9	V10-0.8	V11-1.2
				Client sampling date / time	10-Sep-2020 00:00	10-Sep-2020 00:00	10-Sep-2020 00:00	10-Sep-2020 00:00	10-Sep-2020 00:00
Compound	CAS Number	LOR	Unit		EM2016058-001	EM2016058-002	EM2016058-003	EM2016058-004	EM2016058-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		29.0	31.3	31.4	32.7	30.7
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		5	----	<5	----	5
Barium	7440-39-3	10	mg/kg		60	----	60	----	100
Beryllium	7440-41-7	1	mg/kg		1	----	<1	----	<1
Boron	7440-42-8	50	mg/kg		<50	----	<50	----	<50
Cadmium	7440-43-9	1	mg/kg		<1	----	<1	----	<1
Chromium	7440-47-3	2	mg/kg		47	----	37	----	38
Cobalt	7440-48-4	2	mg/kg		5	----	6	----	7
Copper	7440-50-8	5	mg/kg		58	----	46	----	57
Lead	7439-92-1	5	mg/kg		16	----	13	----	16
Manganese	7439-96-5	5	mg/kg		13	----	21	----	16
Nickel	7440-02-0	2	mg/kg		15	----	18	----	16
Selenium	7782-49-2	5	mg/kg		<5	----	<5	----	<5
Vanadium	7440-62-2	5	mg/kg		158	----	134	----	135
Zinc	7440-66-6	5	mg/kg		21	----	16	----	18
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		0.1	----	<0.1	----	<0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	V7-1.2	V8-0.6	V9-0.9	V10-0.8	V11-1.2
				Client sampling date / time	10-Sep-2020 00:00	10-Sep-2020 00:00	10-Sep-2020 00:00	10-Sep-2020 00:00	10-Sep-2020 00:00
Compound	CAS Number	LOR	Unit		EM2016058-001	EM2016058-002	EM2016058-003	EM2016058-004	EM2016058-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	1.2	1.2	1.2	1.2
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		35	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		48	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		46	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
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		1.1	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		1.4	<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		2.5	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		1.4	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		2	<1	<1	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		101	103	92.5	103	90.0
2-Chlorophenol-D4	93951-73-6	0.5	%		97.6	99.8	94.1	99.7	90.4
2.4.6-Tribromophenol	118-79-6	0.5	%		77.3	69.8	64.6	69.3	65.4

1-471

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	V7-1.2	V8-0.6	V9-0.9	V10-0.8	V11-1.2
				Client sampling date / time	10-Sep-2020 00:00	10-Sep-2020 00:00	10-Sep-2020 00:00	10-Sep-2020 00:00	10-Sep-2020 00:00
Compound	CAS Number	LOR	Unit		EM2016058-001	EM2016058-002	EM2016058-003	EM2016058-004	EM2016058-005
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		106	106	103	105	101
Anthracene-d10	1719-06-8	0.5	%		117	117	115	116	113
4-Terphenyl-d14	1718-51-0	0.5	%		103	103	99.9	103	98.5
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		84.8	87.6	86.3	78.3	85.9
Toluene-D8	2037-26-5	0.2	%		82.2	80.0	83.2	76.7	81.3
4-Bromofluorobenzene	460-00-4	0.2	%		95.5	101	100	95.8	102

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	V12-1.2	V13-1.5	V14-Base1.0	V15-1.2	V16
				Client sampling date / time	10-Sep-2020 00:00	10-Sep-2020 00:00	10-Sep-2020 00:00	10-Sep-2020 00:00	10-Sep-2020 00:00
					EM2016058-006	EM2016058-007	EM2016058-008	EM2016058-009	EM2016058-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		26.5	28.3	29.2	29.0	30.6
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		----	<5	----	5	----
Barium	7440-39-3	10	mg/kg		----	60	----	100	----
Beryllium	7440-41-7	1	mg/kg		----	<1	----	1	----
Boron	7440-42-8	50	mg/kg		----	<50	----	<50	----
Cadmium	7440-43-9	1	mg/kg		----	<1	----	<1	----
Chromium	7440-47-3	2	mg/kg		----	31	----	51	----
Cobalt	7440-48-4	2	mg/kg		----	3	----	10	----
Copper	7440-50-8	5	mg/kg		----	37	----	55	----
Lead	7439-92-1	5	mg/kg		----	15	----	15	----
Manganese	7439-96-5	5	mg/kg		----	<5	----	36	----
Nickel	7440-02-0	2	mg/kg		----	10	----	24	----
Selenium	7782-49-2	5	mg/kg		----	<5	----	<5	----
Vanadium	7440-62-2	5	mg/kg		----	118	----	167	----
Zinc	7440-66-6	5	mg/kg		----	12	----	31	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		----	0.2	----	<0.1	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		0.7	<0.5	<0.5	0.6	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	V12-1.2	V13-1.5	V14-Base1.0	V15-1.2	V16
				Client sampling date / time	10-Sep-2020 00:00	10-Sep-2020 00:00	10-Sep-2020 00:00	10-Sep-2020 00:00	10-Sep-2020 00:00
Compound	CAS Number	LOR	Unit		EM2016058-006	EM2016058-007	EM2016058-008	EM2016058-009	EM2016058-010
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		0.7	<0.5	<0.5	0.6	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	1.2	1.2	1.2	1.2
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		62	41	<10	66	<10
C10 - C14 Fraction	----	50	mg/kg		50	<50	70	60	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		50	<50	70	60	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		82	51	14	82	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		76	49	14	78	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	60	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	140
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	60	<50	140
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	60	<50	<50
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		1.5	1.0	<0.5	0.8	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		3.8	0.9	<0.5	3.0	<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		5.8	1.9	<0.2	3.8	<0.2
^ Total Xylenes	----	0.5	mg/kg		4.3	0.9	<0.5	3.0	<0.5
Naphthalene	91-20-3	1	mg/kg		1	<1	<1	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		88.1	106	100	99.0	104
2-Chlorophenol-D4	93951-73-6	0.5	%		89.7	100	94.2	95.2	96.8
2.4.6-Tribromophenol	118-79-6	0.5	%		65.3	70.5	68.7	69.0	68.7

1-474

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	V12-1.2	V13-1.5	V14-Base1.0	V15-1.2	V16
				Client sampling date / time	10-Sep-2020 00:00	10-Sep-2020 00:00	10-Sep-2020 00:00	10-Sep-2020 00:00	10-Sep-2020 00:00
Compound	CAS Number	LOR	Unit		EM2016058-006	EM2016058-007	EM2016058-008	EM2016058-009	EM2016058-010
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		100	107	99.9	103	110
Anthracene-d10	1719-06-8	0.5	%		110	117	111	112	119
4-Terphenyl-d14	1718-51-0	0.5	%		98.0	104	99.2	100.0	105
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		81.6	83.4	76.9	83.9	81.4
Toluene-D8	2037-26-5	0.2	%		78.6	79.6	69.6	78.2	76.8
4-Bromofluorobenzene	460-00-4	0.2	%		91.8	91.4	86.4	89.8	93.3

Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	54	125
2-Chlorophenol-D4	93951-73-6	65	123
2.4.6-Tribromophenol	118-79-6	34	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	61	125
Anthracene-d10	1719-06-8	62	130
4-Terphenyl-d14	1718-51-0	67	133
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124

Appendix 2 – ES&D Soil Sampling SOP

1 Sampling Plan

Each soil sampling regime needs to follow a sampling plan. The sampling plan will outline the number and location of samples and what analytes will be tested for.

The minimum number of samples and QAQC samples required will depend on the volume and homogeneity of material, and on the reason for sampling. Table 1 shows guidelines:

Table 1: Sampling Guidelines

Sampling	Reference
Soil classification for disposal	IB105
Soil sampling for UPSS removal	UPSS 2
Site characterisation, classification, validation and assessment	NEPM
Agricultural	DPIPWE

Where:

- IB105 - Information Bulletin No.105 – Classification and Management of Contaminated Soil for Disposal, EPA Tasmania, V3, 2018
- UPSS 2 – EPA Tasmania Technical Guideline, UPSS 2: Decommissioning Assessment – Sampling and Risk Assessment Requirements, V3 2018
- NEPM – National Environment Protection (Assessment of Site Contamination) Measure April 1999 (as amended 2013), Schedule B2: Guideline on Site Characterisation
- DPIPWE – Soil Sampling Procedure, DPIPWE, 2014

Additionally, all soil sampling must be done according to one or both of the following Australian Standards:

- AS 4482.1:2005 Guide to the investigation and sampling of potentially contaminated soil, part 1: Non-volatile and semi-volatile compounds
- AS 4482.2:1999 Guide to the investigation and sampling of potentially contaminated soil, part 2: Volatile substances

And for UPSS removal:

- AS 4976 The Removal and Disposal of Underground Petroleum Storage Tanks

2 Sampling

1. Once the sampling plan has been completed and there is a clear sampling method based on the guidelines and Australian Standards, sampling can proceed.
2. Take a representative sample and place directly into soil jar provided by ALS. A clean pair of nitrile gloves must be worn for each sample, and if sample is taken with a hand tool such as a trowel, auger, spade etc., it must be cleaned between samples.
3. Seal jar immediately after sample collection, especially for volatile samples. Label with sample number, sampler, project number, date and time.
4. Place soil jars into a chilled Esky and ship to ALS Melbourne overnight.

References

Information Bulletin No.105 – Classification and Management of Contaminated Soil for Disposal, EPA Tasmania, V3, 2018

EPA Tasmania Technical Guideline, UPSS 2: Decommissioning Assessment – Sampling and Risk Assessment Requirements, V3 2018

National Environment Protection (Assessment of Site Contamination) Measure April 1999 (as amended 2013), Schedule B2: Guideline on Site Characterisation

DPIPWE – Soil Sampling Procedure, https://dpipwe.tas.gov.au/agriculture/land-management-and-soils/soil-management/soil-sampling (accessed 17/12/19), DPIPWE, 2014

AS 4482.1:2005 Guide to the investigation and sampling of potentially contaminated soil, part 1: Non-volatile and semi-volatile compounds

AS 4482.2:1999 Guide to the investigation and sampling of potentially contaminated soil, part 2: Volatile substances

AS 4976 The Removal and Disposal of Underground Petroleum Storage Tanks

26213/13

Department of Justice
WORKSAFE TASMANIA

Henty House, 1 Civic Square, LAUNCESTON, Tas, 7250
Phone: 03 6777 2854 | Fax: 03 6334 4543
Email: Danny.Dougherty@justice.tas.gov.au Web: www.worksafe.tas.gov.au

REGISTERED POST - SENDER TO KEEP
491550503019

0478

14/11/2013

LJ & HF Williams
77 Main Road
CRESSY TAS 7302

Dear Mr Len Williams,

WORK HEALTH and SAFETY ACT 2012
DECOMMISSIONING AN UNDERGROUND PETROLEUM STORAGE SYSTEM

Thank you for taking my telephone call of earlier today.

The purpose of this letter is to confirm the details of our telephone conversation which were to:

1. inform you of recent changes to occupational health and safety legislation in Tasmania; and
2. as a result of these legislative changes advise you on your obligations in respect to the partially decommissioned underground petroleum storage system (UPSS) involving 2 underground fuel tanks, 1 x 4.5KL and 1 x 10.0KL, that is still present at 77 Main Road, Cressy; and
3. to draw you attention to the strict decommissioning rules and procedures that have been imposed by the Environment Protection Authority (EPA), a Division of the Department of Primary Industries, Parks, Water and Environment, via the *Environmental Management and Pollution Control (Underground Petroleum Storage Systems) Regulations 2010* (the UPSS Regulations) that it administers.

1/ Occupational Health and Safety Legislative Changes

On the 1st January 2013 as part of the introduction of nationally uniform occupational health and safety laws across Australia, Tasmania's Parliament enacted the *Work Health and Safety Act 2012* (the Act) and the *Work Health and Safety Regulations 2012* (the Regulations).

This legislation is administered on behalf of the Regulator by WorkSafe Tasmania, a Division of the Department of Justice.

Concurrent with these changes, and in accordance with the *Work Health and Safety (Transitional and Consequential Provisions) Act 2012* and the *Work Health and Safety (Transitional and Consequential Provisions) Regulations 2012*, the following legislation, namely:

1. the *Workplace Health and Safety Act 1995*; and
2. the *Workplace Health and Safety Regulations 1998*; and
3. the *Dangerous Substances (Safe Handling) Act 2005*; and
4. the *Dangerous Substances (Safe Handling) Regulations 2009*

was repealed.

The new legislation and its related codes of practice and guidance material can be accessed and downloaded free of charge via the following website: www.worksafe.tas.gov.au

2/ Partial Decommissioning of the Underground Petroleum Storage System (UPSS)

In accordance with the abovementioned Act and Regulations the UPSS must be partially decommissioned as follows:

1. All the underground storage tanks must be empty and freely venting to the atmosphere; and
2. The filling point of each tank must be securely closed; and
3. Every fuel dispensing pump must have been removed; and
4. The power supply from the switchboard to each dispensing pump must have been removed; and
5. Where safety conditions/requirements deem it necessary security fencing must be erected around the UPSS.

3/ What the EPA administered UPSS Regulations require

Under the *Environmental Management and Pollution Control (Underground Petroleum Storage Systems) Regulations 2010* (the UPSS Regulations) that became law on the 31st March 2010 and are administered by the EPA there are strict conditions and timeframes that, depending on when the UPSS was partially decommissioned, apply to how long it can remain partially decommissioned before the Operator either has to totally decommission and remove it or alternatively has to fully recommission and put it back into service. Basically one of the following approaches will apply:

1. Decommissioning Storage Systems that were in use on or after the 31 March 2010

   The UPSS Regulations requires that if a UPSS ceases to be used the infrastructure owner must temporarily or permanently decommission the storage system.

   Temporary decommissioning can only occur for 12 months and the storage system must be back in use within this time limit or it must be permanently decommissioned.

   Refer to the attached copy of the relevant EPA Tasmania document for a full outline of action required and where to find more information and/or seek assistance.

2. Decommissioning Abandoned Storage Systems that were not in use on 31 March 2010 and have not been used since.

   The UPSS Regulations do not require that abandoned storage systems that fall into this category are fully decommissioned within a certain timeframe. The intent of the regulations is that abandoned storage systems will be fully decommissioned:

   - During redevelopment of site; or
   - As part of a sale agreement for the site; or
   - When the infrastructure owner determines that they want to fully decommission the storage system.

   Refer to the attached copy of the relevant EPA Tasmania document for a full outline of action required and where to find more information and/or seek assistance.

If you have any queries in regards to this letter please feel free to contact me.

Your co-operation is much appreciated.

Yours sincerely,

C D DOUGHERTY
COMPLIANCE MANAGER/DELEGATE OF THE REGULATOR

SITE MANIFEST

WORKPLACE STANDARDS TASMANIA
ABN 36 388 980 563

0478 - WILLIAMS SERVICE STATION

77 MAIN ROAD
CRESSY

Licence 28192 valid from to

Class	Description	Type	Size	L	Unit	Qty	Location	
2.1	LP GAS	CYLS	0.110	Y	L	2	???	Unknown storage location code : LW
3	PETROL	TAN	4.500	Y	L	1	U/G	
3	PETROL	TAN	10.000	Y	L	1	U/G	

1-484

Department of Justice
WORKPLACE STANDARDS TASMANIA

PO Box 56 ROSNY PARK TAS 7018
Phone: 1300 366 322 (Inside Tasmania)
03 6233 7657 (Outside Tasmania) *Fax:* 03 6233 8338
Email: wstinfo@justice.tas.gov.au *Web:* www.wst.tas.gov.au

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30 June 2010

WILLIAMS SERVICE STATION
77 MAIN ROAD
CRESSY TAS 7302

Dear Sir/Madam

Dangerous Substances (Safe Handling) Act 2005
Location: 77 MAIN ROAD CRESSY TAS

This letter is to remind you that new legislation, the *Dangerous Substances (Safe Handling) Act 2005* commenced on 1 July 2009 replacing the existing dangerous goods legislation.

Our records indicate that you are an occupier of a dangerous substances location that may require Notification under the Dangerous Substances (Safe Handling) legislation and to date, our office has not received a Notification for the above location.

As an occupier you have obligations under the new legislation. You are advised to identify your obligations and determine what action you will need to undertake to ensure compliance.

The new Dangerous Substances (Safe Handling) legislation has introduced new concepts and requirements.

Facilities storing dangerous substances will be defined either as a:

- DSL - Dangerous Substances Location; or a
- LDSL - Large Dangerous Substances Location; or a
- MHF - Major Hazard Facility

These definitions are determined by quantity and hazard levels of the dangerous substances stored. Locations identified as being a LDSL or 'possible' MHF must notify Workplace Standards Tasmania within 3 months of the date of this letter to avoid non-compliance and possible fines or prosecution.

Storage of dangerous substances that may not be notifiable still require construction, maintenance and management of the location to be in compliance with the relevant standards and codes.

To find more information about the new legislation please visit our website at:
www.wst.tas.gov.au/dangerous_substances or contact our Helpline by phone on 1300 366 322.

12/12/11 Spoke to Len @ 2.45pm - About to do School Run - I'll ring back tomorrow.

Yours sincerely

P.L. Davis

Peter Davis
Manager Dangerous Substances Unit

1-486

Tasmania

DEPARTMENT of INFRASTRUCTURE, ENERGY & RESOURCES
WORKPLACE STANDARDS TASMANIA
PO BOX 56 ROSNY PARK TAS 7018
TELEPHONE: 1300 366 322
OR (03) 6233 7657
FAX (03) 6233 8338

WORKPLACE STANDARDS TASMANIA - 8 JUL 2003 ROSNY

APPLICATION FOR A LICENCE TO KEEP DANGEROUS GOODS (KEEPER'S LICENCE)

DANGEROUS GOODS ACT 1998

DANGEROUS GOODS (GENERAL) REGULATIONS 1998

PLEASE READ THE GUIDANCE NOTES ON THE REVERSE SIDE OF THIS PAGE FOR TERMS USED BEFORE COMPLETING THIS APPLICATION FORM

LAUNCESTON (F)

Please print in BLOCK letters

1. TYPE OF APPLICATION (Please tick a box)

Renewal of existing licence [E] ✓ New licence ☐ Transfer of a licence ☐

For renewal or transfer please indicate the existing site number (shown on the Notice for Payment) 0478

2. INTENDED LICENSEE L.J. + H.F. Williams

Name (Business: incorporated company name, or the position and name of a senior person in the company. Private: the owners name)
WILLIAMS SERVICE STATION – CALTEX

ACN (business only) – ABN (business only) 26 942 497 247 Telephone 03 6397 6251 Fax 03 63975090.

Mailing address (Street/PO Box) 77-79 MAIN Street Suburb Cressy State & Postcode TAS 7302

Email –

I certify that the information contained on this application is accurate and correct:

Name (if same as above, please write 'as above') HELEN WILLIAMS Position PART OWNER

Signature of licensee H. F. Williams Date 7-7-2003

WORKPLACE STANDARDS LAUNCESTON TASMANIA
REC'D 24 JUL 2003
DOC REF.
OFFICER DATE

3. DEPOT TO BE LICENSED (ADDRESS WHERE THE GOODS ARE STORED) ✓

Business Trading Name (or the name of the owner of a private depot)
WILLIAMS SERVICE STATION

Street address of depot 77 MAIN ST same site Suburb Cressy Postcode 7302

Site telephone AS ABOVE Site fax AS ABOVE Name of occupier (or owner of a private store) LEN + Helen WILLIAMS.

4. CONTACT DETAILS (provide details of the person who should be contacted about information contained in this form, if different to licensee)

Name AS ABOVE. Position AS ABOVE

Mailing address (Street/PO Box) " Suburb -- State & Postcode

Telephone/Mobile " Fax --

Email –

Division of Mines & Mineral Resources
Dangerous Goods Inspectorate - 001 Inspection

Site No: 0478 Business Name: CALTEX SERVICE STATION - CRESSY
Zone: JM02 Owner Occupier: LJ & HF WILLIAMS
Licence No: Site Address*: (77) MAIN ST
Type: S Site City: CRESSY
Status: L Site State: TAS. Pcode: 7302
Supplier:

Debtor No: Debtor Name: AS ABOVE
Debtor Address:
Debtor City:
Debtor State: Pcode:

Insp. Date: 06/01/92 Inspector: JM
Approval ☐ Follow Up ☐ Routine ☑ New ☐ Additional ☐
Approval Date: Approval No:

Comments DEFECT NOTICE NO. 972 ISSUED

REQUIRE AT LEAST ANOTHER 4.5 kg DRY CHEMICAL FIRE EXTINGUISH

DISPENSER HOSES TO BE REPLACED.

LPG DECANT PROCEDURES GUIDE AND 'NO SMOKING' SIGNS REQUIRE

* Melissa edit Debtor address

MINES
File Ref. OH-78
10 JAN 1992
Doc. Ref. 2021
Action Officer: CB Initials:
Resubmit to Date

DATA ENTRY

Add Site ☐ Increase Storage ☐
Modify Site ☐ Reduce Storage ☐
Cancel Site ☐ Routine ☑

Date 20/01/92
User CB

STORAGE DETAILS

CODE	TYPE	SIZE	UNIT	QUANTITY	LOCN
PETR	TANK	10*0	KL	1	U/G
PETR	TANK	4*5	KL	1	U/G
LPG	CYLS	0*088	KL	2	L/W
PUMP	S/E	*	EA	2	
		*			
		*			
		*			
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		*			

b

Please file 0478.

79 MAIN ST
Cressy
2.3.90

8 MAR 1990
DEPT. OF MINES

Dept of Mines
Dear SIR,
With Regard to Licence No 10183/64005
the ADDRESS SHOWN is 16 main ST, Cressy,
however the correct ADDRESS is 79 MAIN ST.
Cressy.
Would you please ALTER ACCORDINGLY
Thanking you.

Yours faithfully,
(Mrs) Helen williams

Done
8.3.90
MB

MINES
File Ref. 0478
10 JAN 1990
Doc. Ref. 1629.

Action Officer	Initials
Rap	
CB	
Resubmit to	Date

Licence No	Debtors No
	A10630

INSPECTION REPORT 001
KEEPING DANGEROUS GOODS

FILE NO: 0478 AREA CODE: DATE: 8.1.90

BUSINESS TRADING NAME:
Caltex Service Station Cressy

OWNER/OCCUPIER:
Mr Len Williams

POSTAL ADDRESS: 16 Main Road
Cressy

LOCATION OF STORAGE: as above

APPROVAL DATE: 30.11.89 APPROVAL NO: 8089 INSPECTION DATE: 5.1.90

TYPE OF INSPECTION: APPROVAL/FOLLOW-UP/ROUTINE/NEW/ADDITIONAL SUPPLIER: Caltex

RECOMMENDED FOR LICENSING: YES/~~NO~~ INSPECTOR:

MARKS: Please note additional 2 x 45kg LPG gas cylinders for decant purposes.

e of dangerous goods	Class	Qty	Size of tanks	O/G O/H U/G	Size - cylinders drums, packages	Qty and type of pumps
Super	3.1	1	10kl	U/G		2 x single
ULP	3.1	1	4.5kl	"		electric
LPG	2.1				2 x 45kg = ~~176~~ 180 Lts	found 460 20.00

RESUBMIT DATE: TO:

5

1-491

FORM 4 (Regulation 34)

TASMANIA
Rec 9660
Dangerous Goods Act 1976

№ 8089

$20
Fee: ~~$10~~

GRANTED TO Tasmanian Petroleum Holdings Pty Ltd

PO Box 416

Devonport TAS 7310

Approval of Site and Construction of Premises for Keeping Flammable Liquids or Dangerous Commodities or the Alteration thereof

Approval for the *~~site and construction~~/*alteration of the site and construction as shown on the approved plan and specifications of a *~~package/storage area~~/*tank for the undermentioned flammable liquids and dangerous commodities, subject to the provisions of the *Dangerous Goods Act* 1976, and regulations being observed and subject to the undermentioned special conditions, situate at Caltex Service Station

16 Main Road, Cressy

This approval is valid only for one year from the date of issue.

Date of issue 30 November 19 89

Chief Inspector of Explosives

Inspector of Explosives

Flammable liquid: Class 3·1 1 x 4.500 u/g tank ULP Litres additional

Class 3·2 Litres

Class 3·3 Litres

L.P.G. (Class 2) Litres

Dangerous commodities:

SPECIAL CONDITIONS

* Strike out if inapplicable

1734 A. B. CAUDELL, Government Printer, Tasmania

1-492

File No. 0478

Date 23.11.89

Senior Mining Engineer, BURNIE	☐		
G. Hunt, BURNIE	☐		
S. Smith, LAUNCESTON	☐		
G. Dyer, LAUNCESTON	☐		
M. Robertson, HOBART	☐	C. Gardner, HOBART	☐
T. Garlick, HOBART	☐	P. Davis, HOBART	✓

Subject: Caltex S/S Cressy

Address: 16 Main Rd Cressy

Proposal: 1x 4500 L tank

Quality of Plans acceptable YES ✓ upp

NO ☐

May I have your Recommendation Please.

.....
Senior Inspector of Explosives

MINES
File Ref. 0478
30 NOV 1989
Doc. Ref. 2427
Action Officer CB Initials
Resubmit to | Date

PLAN RECOMMENDATION REPORT

File No. .....

Date .....

Premises Address: 16 MAIN Rd Cressy

Owner: L & H WILLIAMS

Occupier and Use: L & H WILLIAMS

Plan Submitted By: TASMANIAN PETROLEUM HOLDINGS PTY.

Address: Victoria Bridge Devonport 7310 P.O. Box 416 D'Port 7310

Receipt No. 9660

Proposal For: 1x additional 4500 L U.L.P Tank U/G.

The above plans were checked, and Site inspected and the following is recommended.

Suitable for approval: yes

Subject to: .....

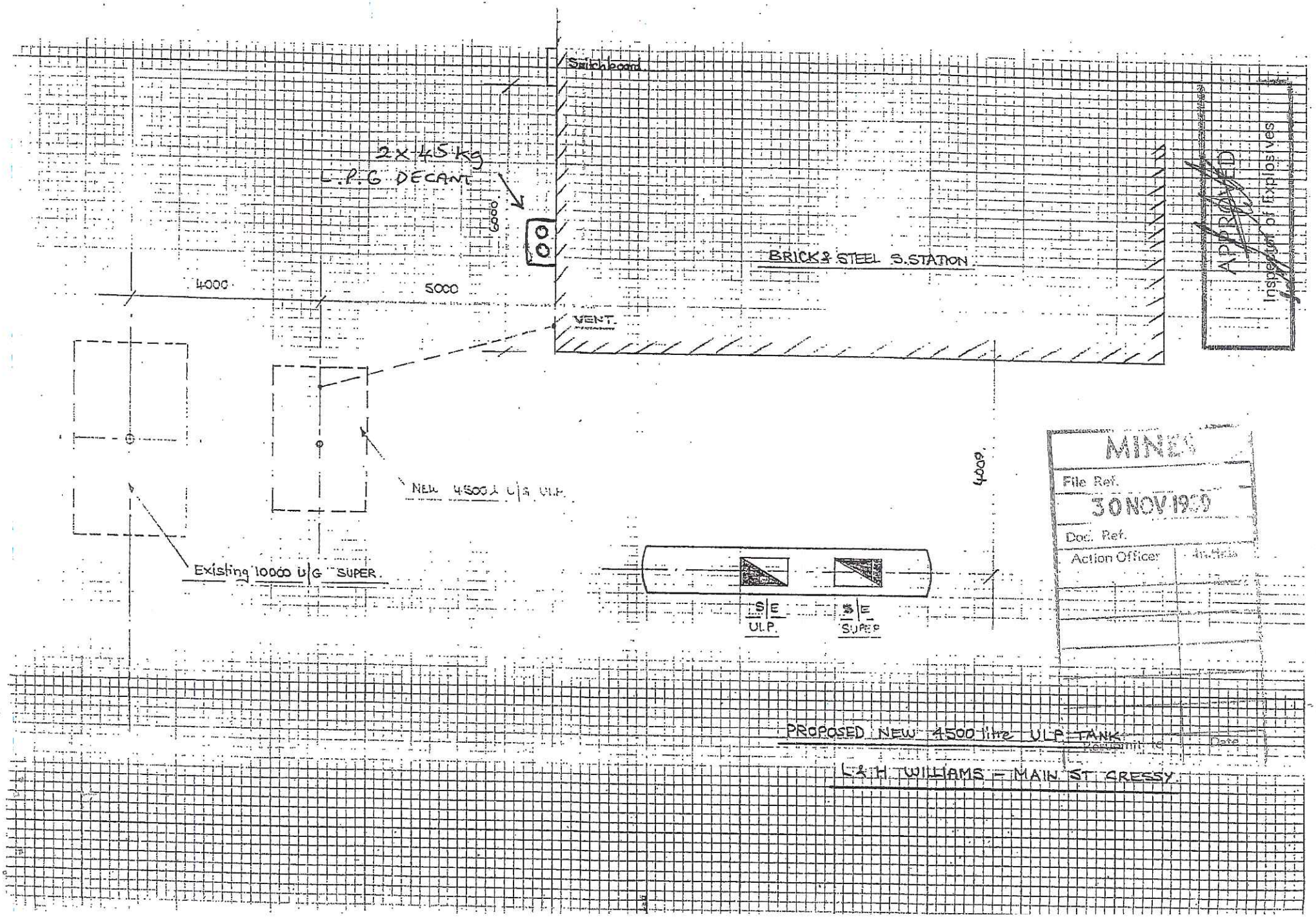
.....

Not Suitable for approval: .....

Reason: .....

.....

P L Davis
INSPECTOR OF EXPLOSIVES


Switchboard
2 x 45 kg
L.P.G DECANT
6000
BRICK & STEEL S.STATION
4000
5000
VENT.
NEW 4500 L U/G U.L.P.
Existing 10000 U/G "SUPER.
S E
U.L.P.
S E
SUPER
6000
PROPOSED NEW 4500 litre U.L.P. TANK
L & H WILLIAMS — MAIN ST CRESSY
APPROVED
Inspector of Explosives
30 NOV 1989
MINES
File Ref.
30 NOV 1989
Doc. Ref.
Action Officer
Date
P+R Renewal Plans
1-493

25. 8 64

LAUNCESTON.

WILSONS SERVICE STATION.

MAIN ST CRESSY.

MOBIL.

22-5-64

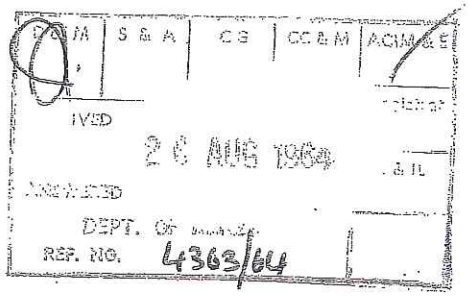
24-6-64

ALTERATIONS

1 x 2000 TANK INSTALLED. NOT 1 x 3000 AS SHOWN ON APPROVED PLAN.

D K Sorlam

GALLONAGE REMAINS AT 3000 A. 4 x 500 A. ABANDONED.



Department of Mines,

Tasmania.

Date 25 / 8 /1964

For the Director of Mines, Hobart
From the Inspector of Explosives, LAUNCESTON.....

RECORD OF INSPECTION OF INSTALLATION.

Premises of: WILSONS SERVICE STATION.

Known as:

Premises at: MAIN ST CRESSY.

Oil Company: MOBIL.

Date of Approval: 22-5-64

Date of inspection 24-8-64

Finding: ~~Unsuitable~~) ~~for Licensing.~~
Suitable)

Pump Outfit ALTERATIONS ~~Package Storage Area.~~

Variation from Approval:
1X2000 TANK INSTALLED. NOT 1X3000 AS SHOWN ON APPROVED PLAN.

Application Form: ~~Left with occupier/Forwarded herewith.~~

Amount of Fee advised ~~Yes/No~~

....D.R.Bonham.....

GALLONAGE REMAINS AT 3000 A. 4X500A. ABANDONED.

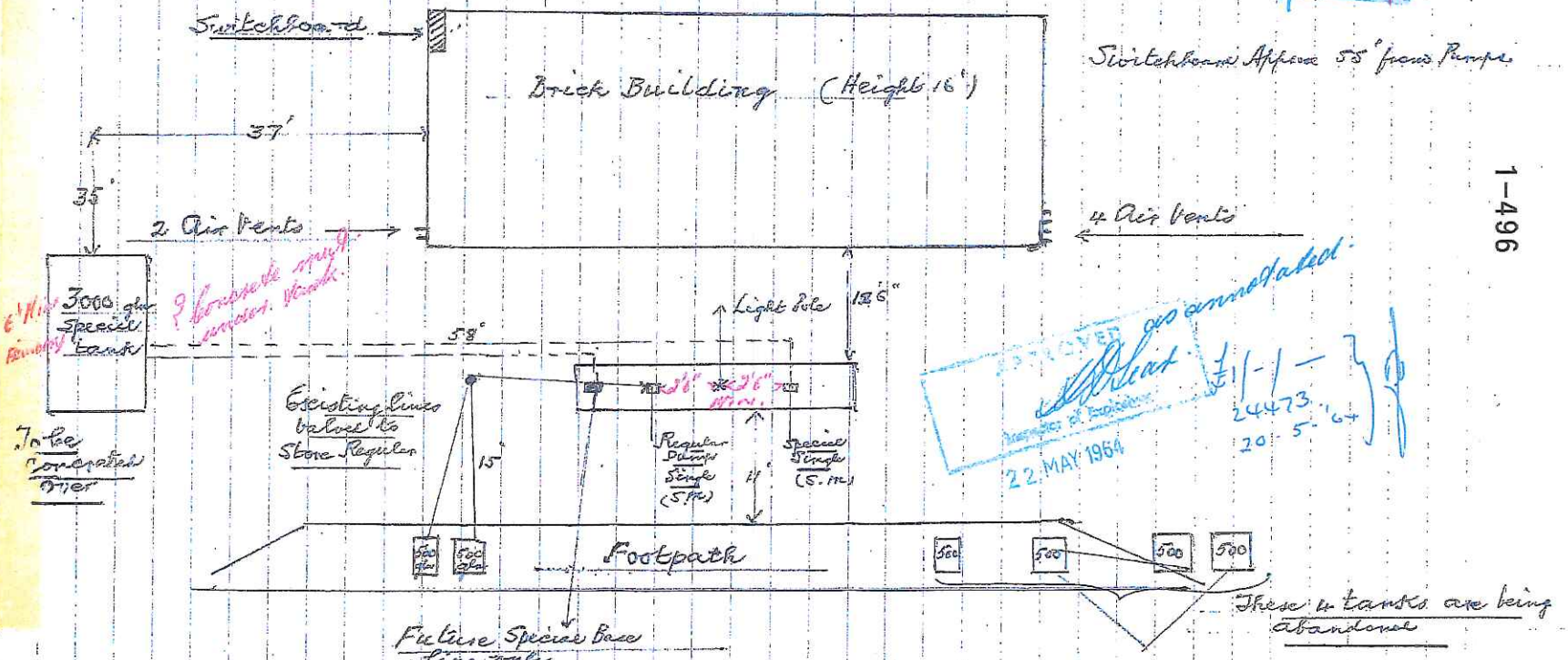
W 263

53

19.5.64.

Alterations at Wilsons Service Station - Main Rd. Cressy

Installation of 1 x 3000 gln tank for Special
Relocate 2 Singles and base for future - Single
Removal 2 Dual Pumps.



Switchboard Approx 55' from Pumps

These 4 tanks are being abandoned

gas connected.
1/1/-
24473
20.5.'64

1-496

(Regulation 78)

FORM 5

TASMANIA

Inflammable Liquids Act 1929

No 1441

Fee, £1

Granted to Mobil Oil Aust. Ltd.,
Collins Street,
HOBART

Approval of Site and Construction of Premises for Keeping Inflammable Liquids or Dangerous Commodities or the Alteration thereof.

Approval for the *site and construction/*alteration of the site and construction as shown on the approved plans and specifications of a *package storage area/*tank for the undermentioned inflammable liquids and dangerous commodities, subject to the provisions of the *Inflammable Liquids Act* 1929, and regulations being observed and subject to the undermentioned special conditions, situate at Wilson's Service Station - Cressy

This approval is valid only for one year from the date of issue.

Date of issue 22nd May, 1964

Chief Inspector of Explosives

Inspector of Explosives

Inflammable liquid: Class A 3000 Gallons

Class B ..... Gallons

Dangerous commodities: .....

SPECIAL CONDITIONS

Installation 1 x 3000 gal u/g tank Re-locate two s/e and base for future s/e. Remove two dual pumps.

* *Strike out if inapplicable*

75601

I/We Mrs. L R. Anderson

of Cressy.

hereby agree to the Vacuum Oil Company Pty. Ltd. installing two

Dual Melo Pump/s and ° gallon underground tanks

at my premises situated at Main St. Cressy.

Signed: L R Anderson

Date: 7. 9-54

A12

11599. 16 September, 1955

Dear Sir,

Approval is granted for the installation of two G. & B. dual electric pumps to replace the existing dual and single pumps at the premises of L.R. Anderson, Cressy, conditionally the outfit is sited in accordance with the approved plan and is installed to conform with the physical and electrical requirements of this Department.

Yours faithfully,

DB

INSPECTOR OF EXPLOSIVES.

The Manager
Vacuum Oil Company
Box 672
HOBART.

L.R. ANDERSON = CRESSY

TO INSTALL 2 G.S. DUAL ELECTRIC PUMPS IN NEW POSITION. TO BE CONNECTED TO EXISTING TANKAGE

EXISTING DUAL & SINGLE ELECTRIC PUMPS TO BE REMOVED

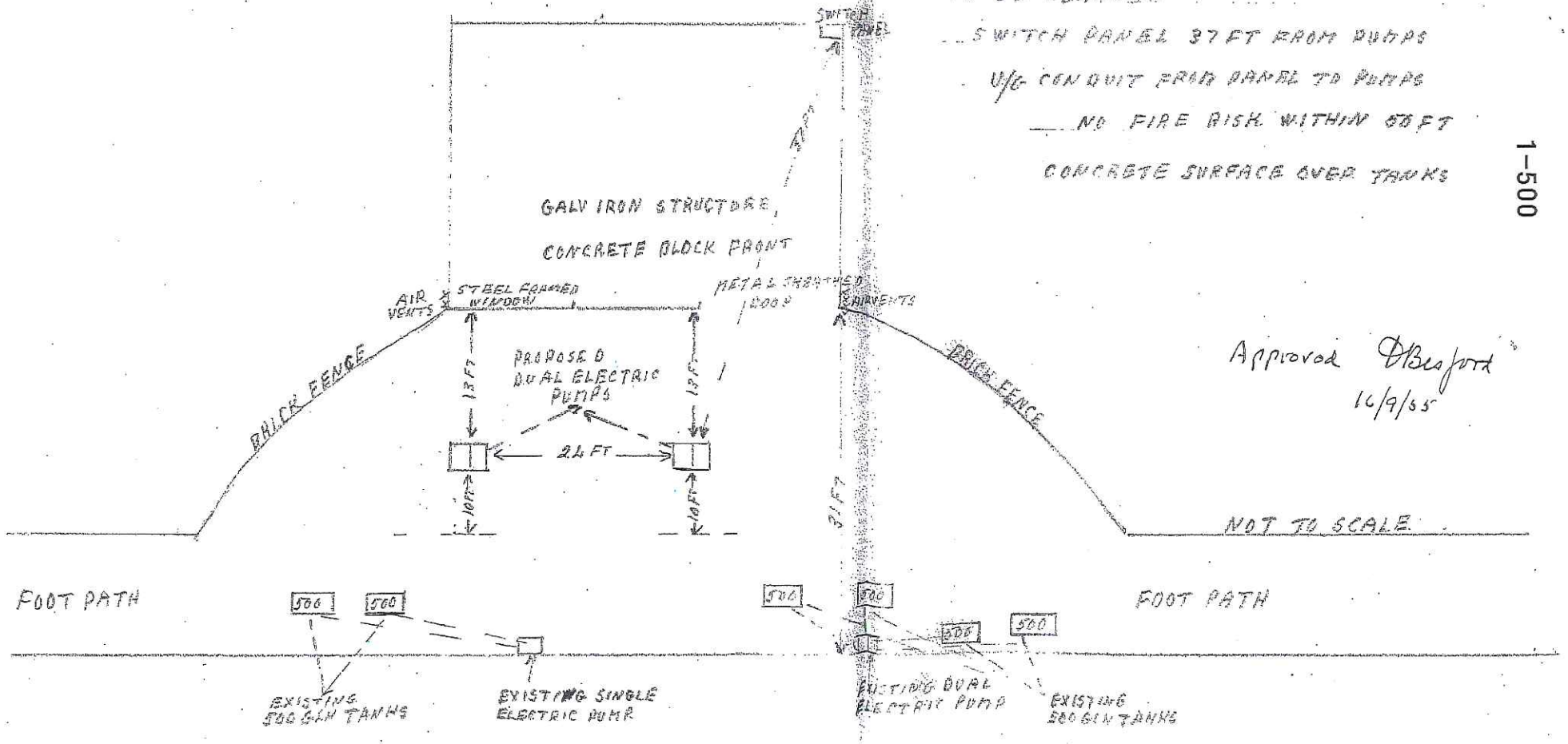
SWITCH PANEL 37 FT FROM PUMPS

U/G CONDUIT FROM PANEL TO PUMPS

NO FIRE RISK WITHIN 50 FT

CONCRETE SURFACE OVER TANKS

1-500



Approved D Beaford
16/9/65

1-501

42602....52 (11)

4

Tasmania.

TELEPHONES:
LABORATORY 845
REGISTRAR OF MINES 691
INSPECTOR OF MINES AND EXPLOSIVES 373
G.P.O. Box, 225.

Inspector of Mines, Magazines, and Explosives Office,
Public Buildings,
Launceston, 8th January, 1953

Reference No.
DEPT. OF MINES, HOBART
-9 JAN 1953
Referred to
Filed in

MEMORANDUM:

With reference to your memorandum of the 14th May,,1952, in connection with the installation of a Golden Fleece Pump at the premises of Mrs. L.R.Anderson, Cressy, Mr. Brown, Golden Fleece representative called on Tuesday last and advised that they do not desire to proceed with this installation.

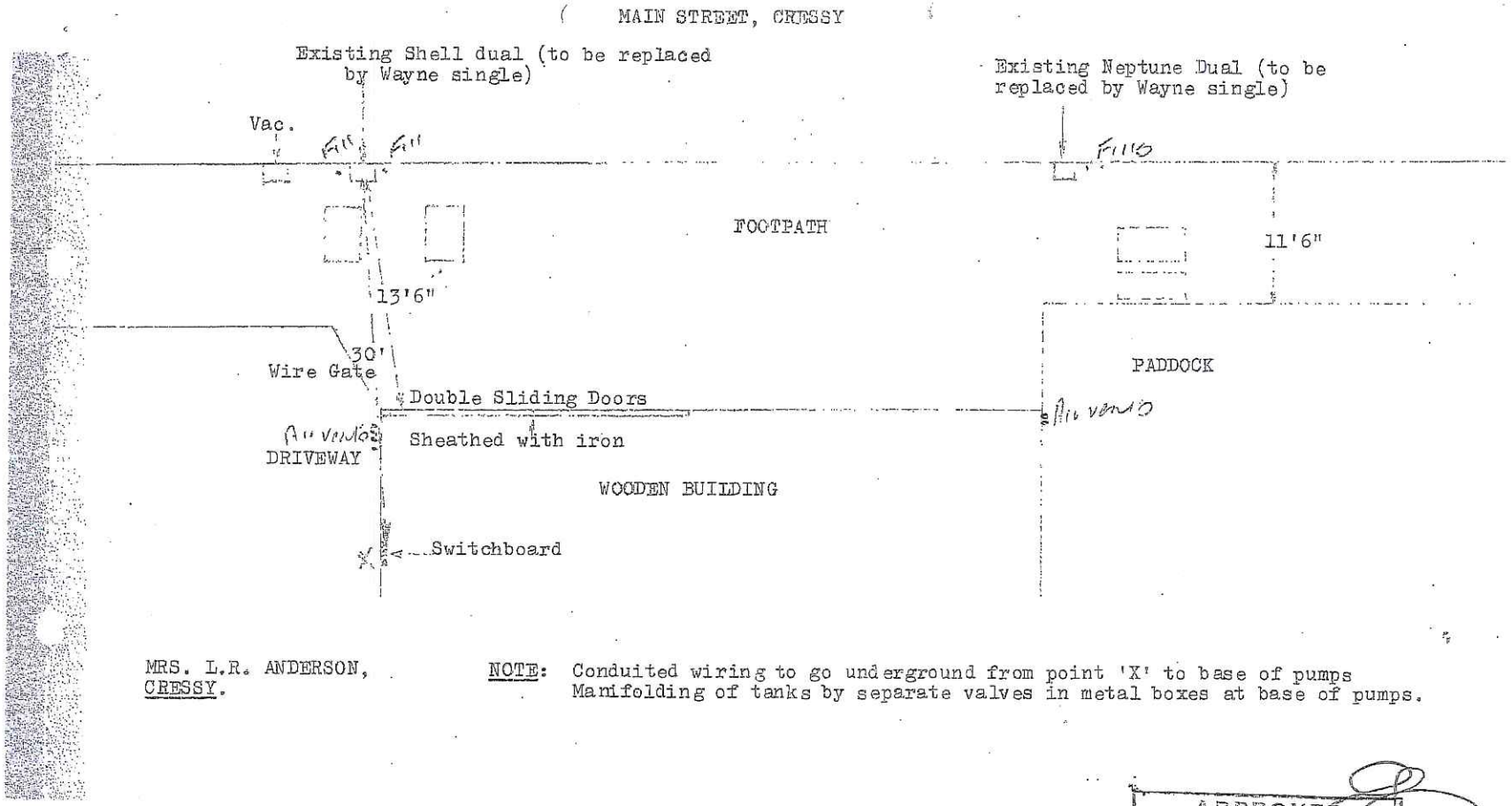
[signature]

INSPECTOR OF MINES & EXPLOSIVES.

The Director of Mines,
HOBART.

Mr Shirley
Now Vacuum Oil Coy
Salo

1-502



MRS. L.R. ANDERSON,
CRESSY.

NOTE: Conduited wiring to go underground from point 'X' to base of pumps
Manifolding of tanks by separate valves in metal boxes at base of pumps.

APPROVED
CHIEF INSPECTOR OF EXPLOSIVES
DIRECTOR OF MINES
27.8.52

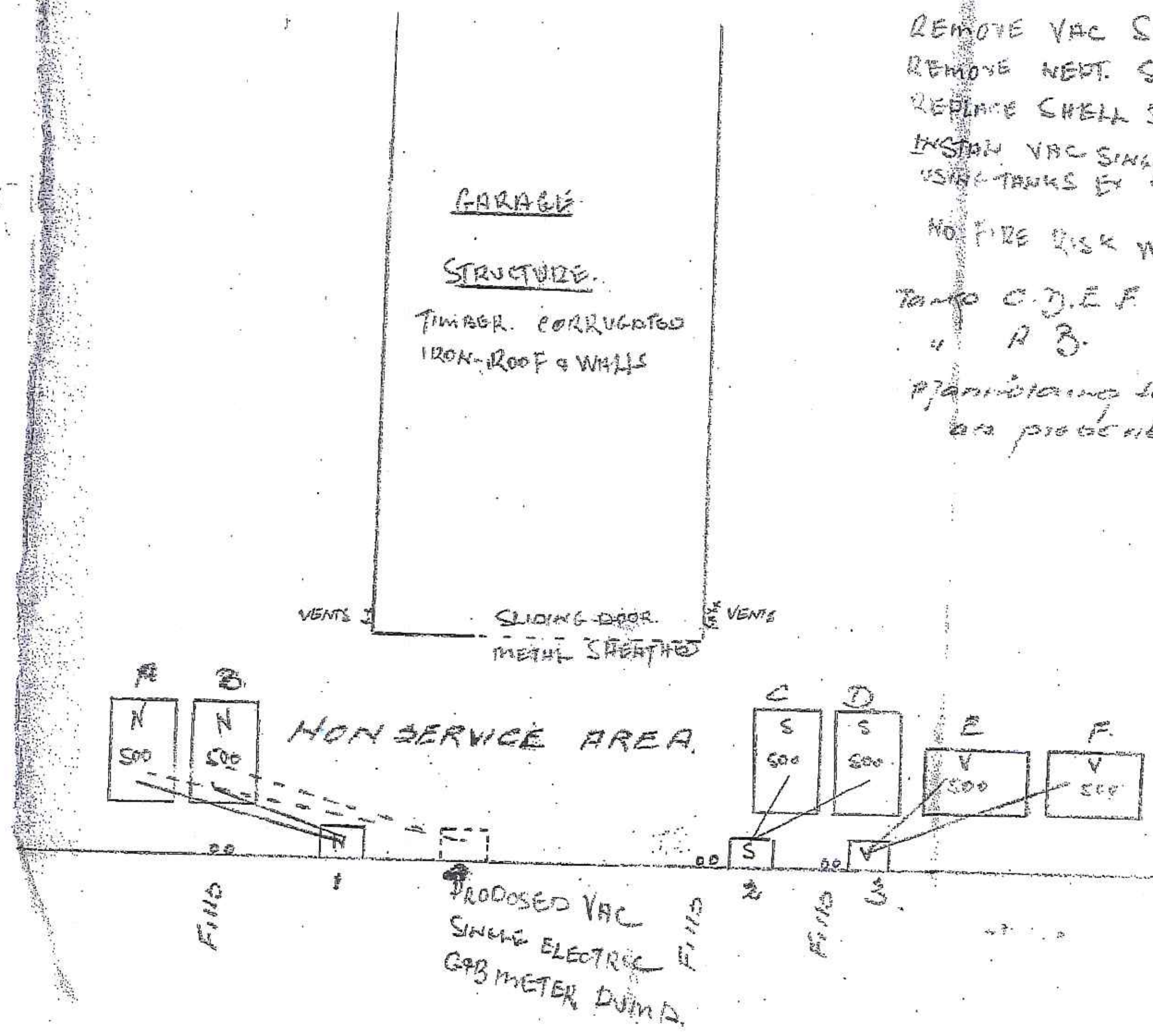
41

L.R. ANDERSON V.O.C. "Solo"
CRESSY.

REMOVE VAC SINGLE. 3
REMOVE NEPT. SINGLE 1
REPLACE SHELL SINGLE WITH VAC DUAL - 2×500 TO EACH SIDE. 2
INSTALL VAC SINGLE IN POSITION INDICATED USING TANKS EX NEPT. 4

NO FIRE RISK WITHIN 50'

Tanks C.D.E.F. to be connected to Pump 2,
" A B. " " " " 4
[illegible] to be regularly [illegible] as prescribed.



APPROVED
CHIEF INSPECTOR OF EXPLOSIVES
DIRECTOR OF MINES
10-12-1952

SCALE 1" = 8'

D 161/52

1:3

11th December, 1952.

Dear Sir,

With an observance of the conditions set forth in the submitted sketch, permission is granted for the installation of G. & B. Electric Petrol Service Pumps at the premises of L.R. Anderson, Cressy.

Yours faithfully,

(W.H. Williams)
DIRECTOR OF MINES
and
CHIEF INSPECTOR OF EXPLOSIVES.

The Manager,
Vacuum Oil Company Pty. Ltd.,
T. & G. Building,
Collins Street,
HOBART.

51515....52 (47)

NOTE.—All communications on Departmental business to be Addressed to the Director of Mines, P.O. Box 177E.

1:2

Department of Mines, Tasmania,

Hobart, 14th May, 1952.

TELEPHONES:

CHIEF CLERK ....
GENERAL OFFICE ....
REGISTRAR OF MINES .... } 4041-4042 (2 lines)
GOVERNMENT GEOLOGIST ....
FIELD GEOLOGISTS .. ..
INSPECTOR OF MINES ....
DIRECTOR OF MINES 3136

MEMORANDUM:

I received your memorandum of the 9th instant in connection with the installation of a Golden Fleece Pump at the premises of Mrs. L. R. Anderson, Cressy.

The difficulty appears to have been overcome in so far as the Golden Fleece Pump installation is concerned but an additional aspect of the matter is as to how far the pumphead will be from the nearer of the two underground tanks of the Vacuum Oil Company. Please inquire and advise me hereon.

DIRECTOR OF MINES.

Mr. R. J. Muir,
Inspector of Explosives,
LAUNCESTON. Tasmania.

42602....52 (11)

Tasmania.

TELEPHONES:
LABORATORY 845
REGISTRAR OF MINES 691
INSPECTOR OF MINES AND EXPLOSIVES 373
G.P.O. Box, 225.

Inspector of Mines, Magazines, and Explosives Office,
Public Buildings,

Launceston, 9th May, 19 52.

MEMORANDUM:

Your memorandum of the 30th April, regarding proposed pump installation for Mrs. L.R.Anderson, Cressy, has been received and I have been in contact with Mr. Brown, Golden Fleece representative for further information.

Mr. Brown stated that whilst it was not probable, it was possible to drive a vehicle over the tanks in their proposed position as there was no kerbing along the foot path edge.

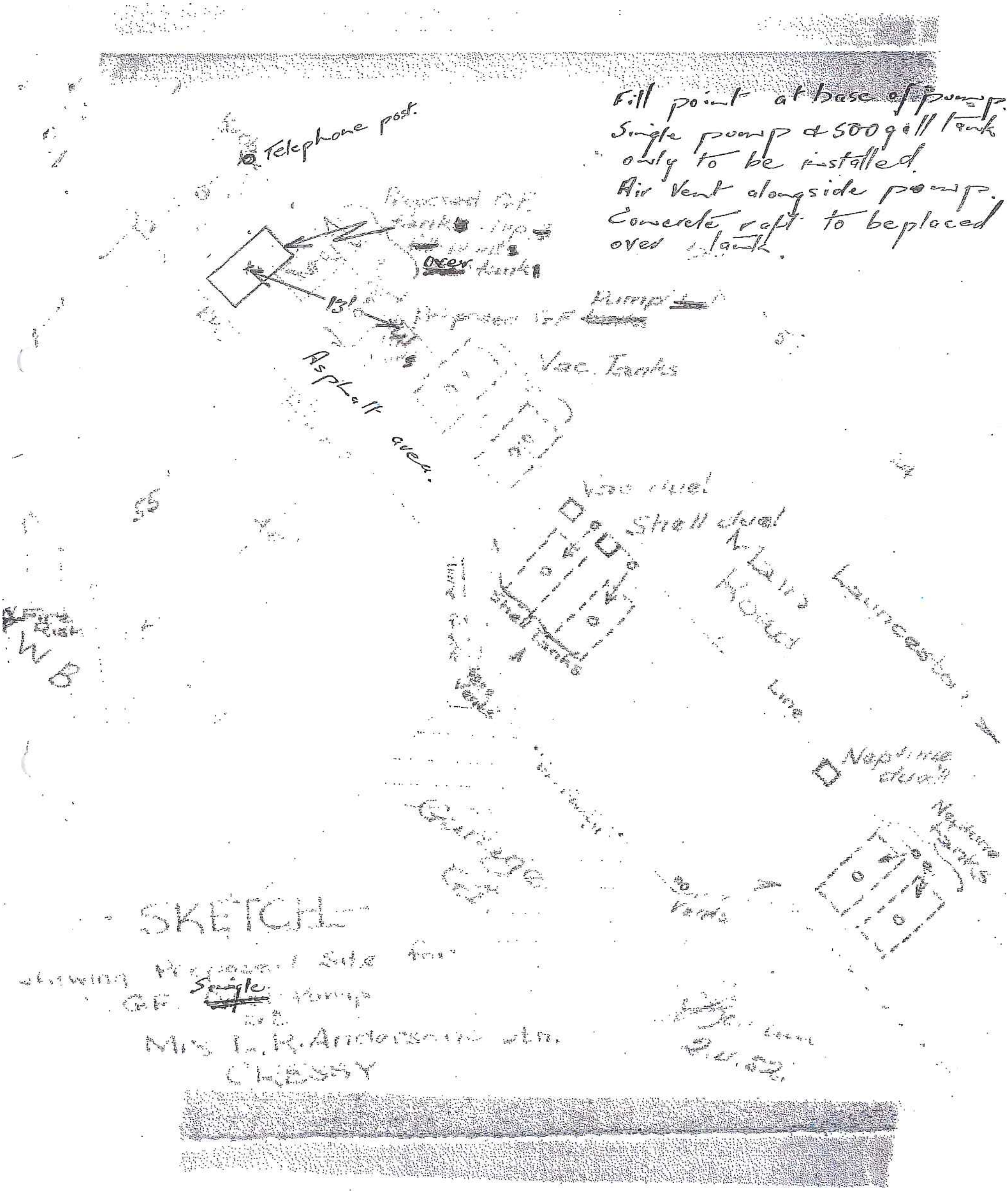
After due consideration Mr. Brown requested that the plan be altered as shown, and it is now intended to install a single pump head with 1 - 500 gallon tank attached only, the tank to be positioned 13 feet away from the pump head and to be covered with a concrete raft so that requirements would be complied with even if an improbable course were taken, and vehicles were driven on the footpath.

It is now considered that the application is in order and is returned to you for approval in case there are any other points you desire to be clarified first.

INSPECTOR OF MINES AND EXPLOSIVES.

The Director of Mines,
HOBART.

3


Fill point at base of pump.
Single pump & 500 gall tank only to be installed.
Air Vent alongside pump.
Concrete raft to be placed over tank.
Telephone post.
Asphalt area.
Vac. Tanks
Shell dual
Shell tanks
Launceston
Line
Neptune dual
Neptune tanks
SKETCH
Single
CRESSY

3

H.C. SLEIGH LIMITED
(INCORPORATED IN VICTORIA)

PETROLEUM DEPARTMENT

TASMANIAN BRANCH
13 Liverpool
39 LOWER COLLINS STREET
HOBART
AUSTRALIA

TELEGRAPHIC ADDRESS:
"SLEIGH" HOBART
TELEPHONE HOBART 6839

PKB:BL

8th April 1952.

W.H. Williams, Esq.,
Chief Inspector of Explosives,
Public Buildings,
Davey Street,
HOBART.

Dear Sir,

We attach hereto, in duplicate, plans for the proposed installation of a dual Manual 'Golden Fleece' Pump at

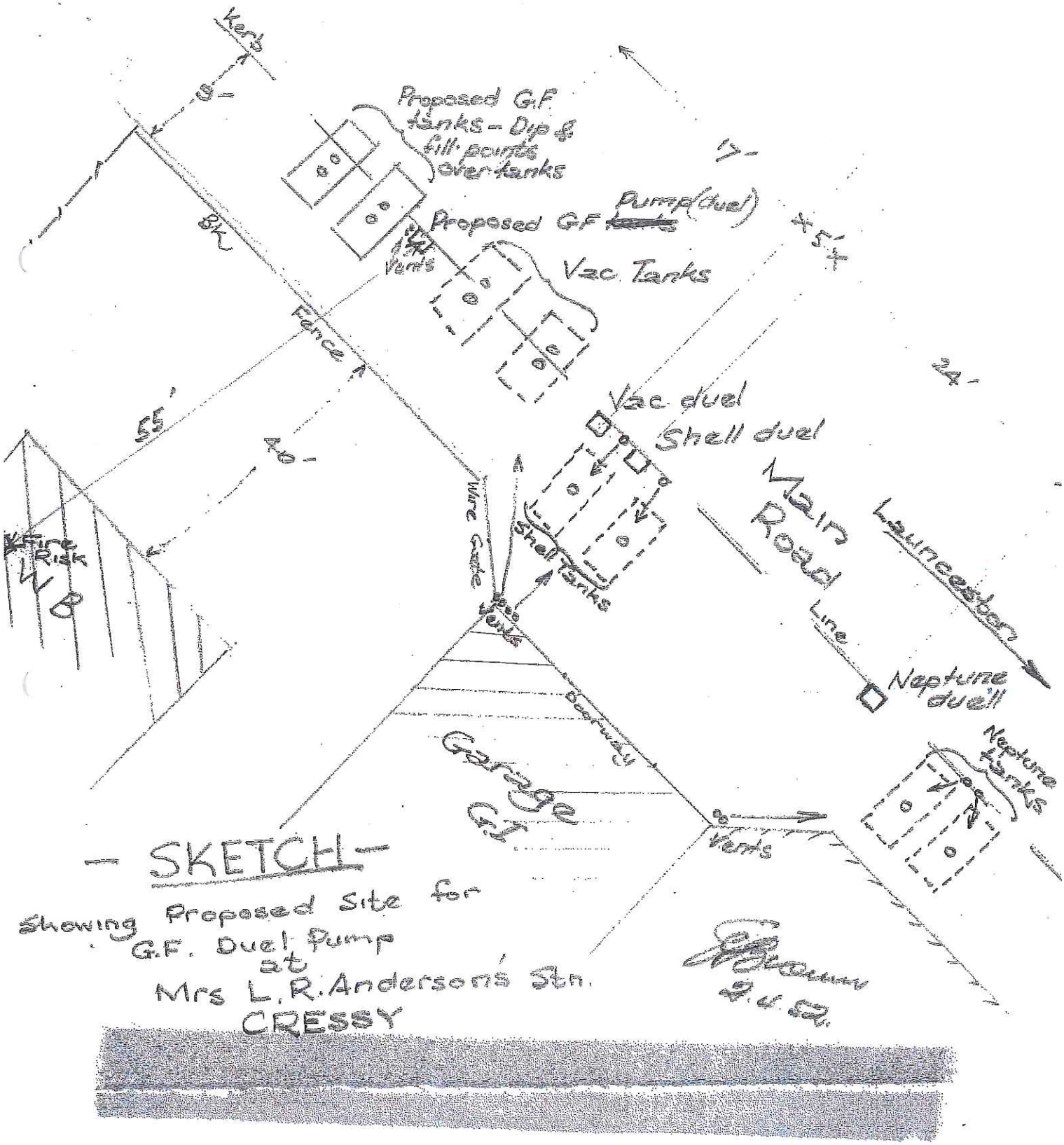
Mrs. L.R. Anderson's
Cressy

We should deem it a favour if you would kindly approve of the plan at your earliest convenience.

Yours faithfully,
H. C. SLEIGH LIMITED,

P. Branch Manager.

Encl.



— SKETCH —

Showing Proposed Site for G.F. Duel Pump at Mrs L.R. Andersons Stn. CRESSY

9th May, 52.

MEMORANDUM:

Your memorandum of the 30th April, regarding proposed pump installation for Mrs. L.R.Anderson, Cressy, has been received and I have been in contact with Mr. Brown, Golden Fleece representative for further information.

Mr. Brown stated that whilst it was not probable, it was possible to drive a vehicle over the tanks in their proposed position as there was no kerbing along the foot path edge.

After due consideration Mr. Brown requested that the plan be altered as shown, and it is now intended to install a single pump head with 1 - 500 gallon tank attached only, the tank to be positioned 13 feet away from the pump head and to be covered with a concrete raft so that requirements would be complied with even if an ~~improper~~ improbable course were taken, and vehicles were driven on the footpath.

It is now considered that the application is in order and is returned to you for approval in case there are any other points you desire to be clarrified first.

INSPECTOR OF MINES AND EXPLOSIVES.

The Director of Mines,
HOBART.

1-511

Application for Licence for Underground Tank.

5870
-10/-
10/8/49

1. Applicant's full name Mrs Lindsay Roy Anderson
2. Applicant's calling or occupation Service Station Proprietor
3. Applicant's postal address Cressy
4. Date of installation
5. Situation of store to be licensed One Side of foot path
6. Name of municipality, town, or township within which, or within 5 miles of which, the store is situated Cressy
7. Total quantity (in gallons) of mineral spirit to be stored 2990
8. Number of tanks to be installed Two
9. Total number of tanks installed Four
10. Is tank or pump inside any building? No
11. If so, state construction of building —
12. How near is the nearest protected works? 12 ft
13. Have you provided approved fire-extinguishers? Yes
14. Is each depot so situated as not to be within 50 feet of any fire, forge, furnace, explosive, highly inflammable substance, or other source of danger? Yes
15. Is each tank at least 2 feet underground? Yes
16. Are all tank vents clear above building, or 12 feet above ground where in the open? Yes
17. Has your installation been approved by an inspector? ~~No~~ yes
18. Has the necessary authority for the installation been obtained from the municipal council? Yes
19. Name of maker of tank and pump Engineering Products Pty Ltd
20. Capacity of tank 500 Gall
21. Are all junctions of electric wires in gas tight junction-boxes? Yes
22. Are all switches and fuses a safe distance from pump? Yes
23. Have you attached approved notices, "No smoking—Stop your Engine," to pump-heads? Yes

I declare that the above statements and answers are true to the best of my knowledge and belief.

Signed L R Anderson

Dated this ~~6-8-49~~ Sixth day of August, 1949.

Licence to be issued for 2990 gals m.s.

2

AU348/48

31st August, 1948.

Dear Sir,

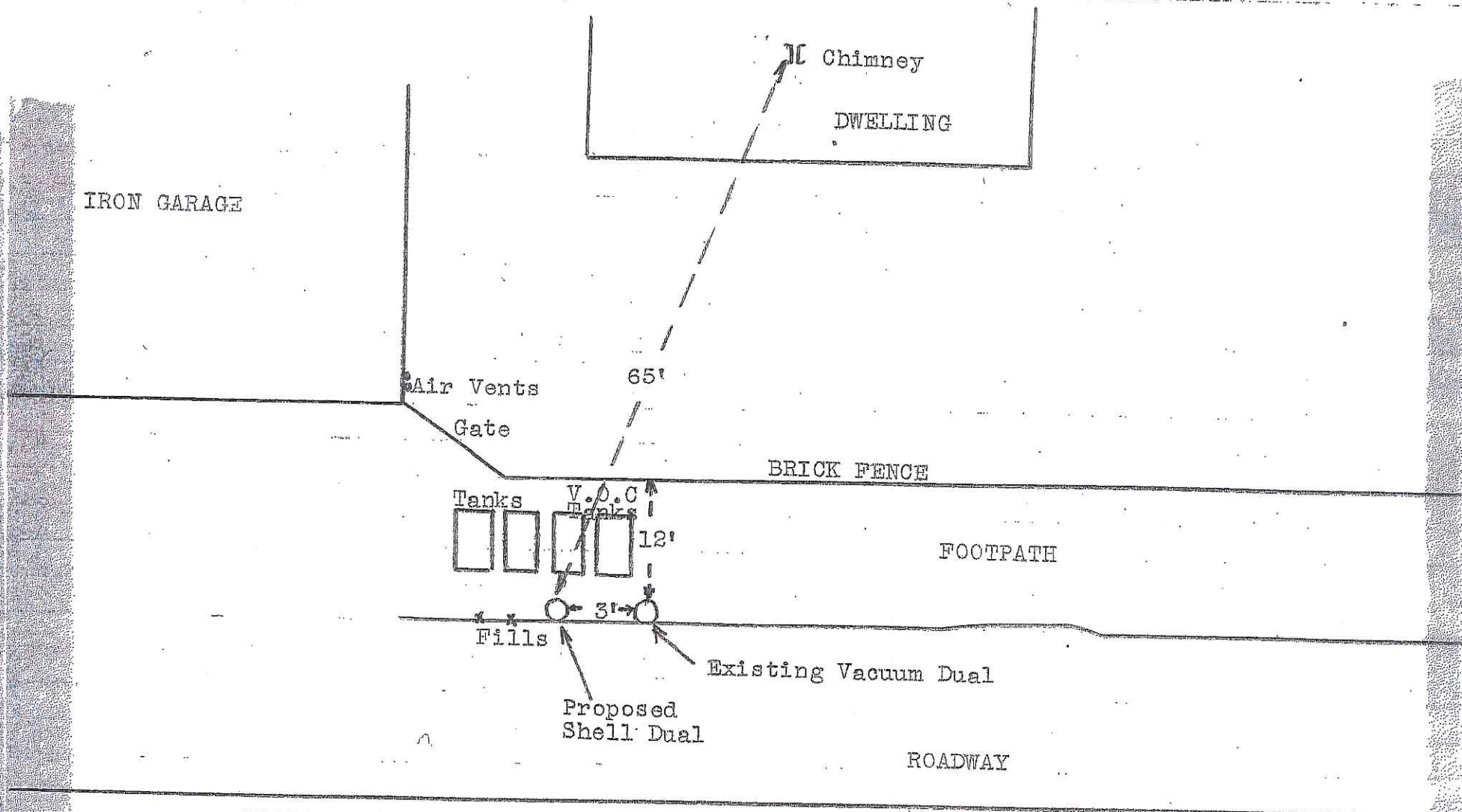
Permission is granted for the installation of a dual pump with two 500-gallon underground tanks at the premises of Mrs. L. R. Anderson, Cressy, conditionally that the outfit is sited in accordance with the submitted sketch and is installed to conform with the provisions of the Inflammable Liquids Act.

It is assumed that the necessary authority will be obtained from the local Council.

Yours faithfully,

CHIEF INSPECTOR OF EXPLOSIVES.

The Manager,
Shell Company of Australia Limited,
Bank of Australasia Buildings,
Elizabeth Street,
HOBART.



PROPOSED INSTALLATION: MRS. L.R. ANDERSON, CRESSY.

No fire risk within 50'
Distance from Pump to Tanks - 9'
Tanks to Filling Points - 3'
Tanks to Wall for Air Vent - 21'

APPROVED
CHIEF INSPECTOR OF EXPLOSIVES
DIRECTOR OF MINES
31.3.1942

1-513

THE SHELL COMPANY OF AUSTRALIA LIMITED

(INCORPORATED IN GREAT BRITAIN)

BANK OF AUSTRALASIA BUILDINGS, ELIZABETH ST.,

HOBART.

P.O.BOX 296 C.

TELEPHONE 7021
TELEGRAPHIC ADDRESS
"SHELLCO," HOBART

ALL COMMUNICATIONS TO BE ADDRESSED TO THE COMPANY

IN REPLY PLEASE REFER TO

CMC:PO'B

12th April, 1948.

The Chief Inspector of Explosives,
Department of Mines,
HOBART.

Dear Sir,

PROPOSED INSTALLATION : MRS. L.R. ANDERSON, CRESSY.

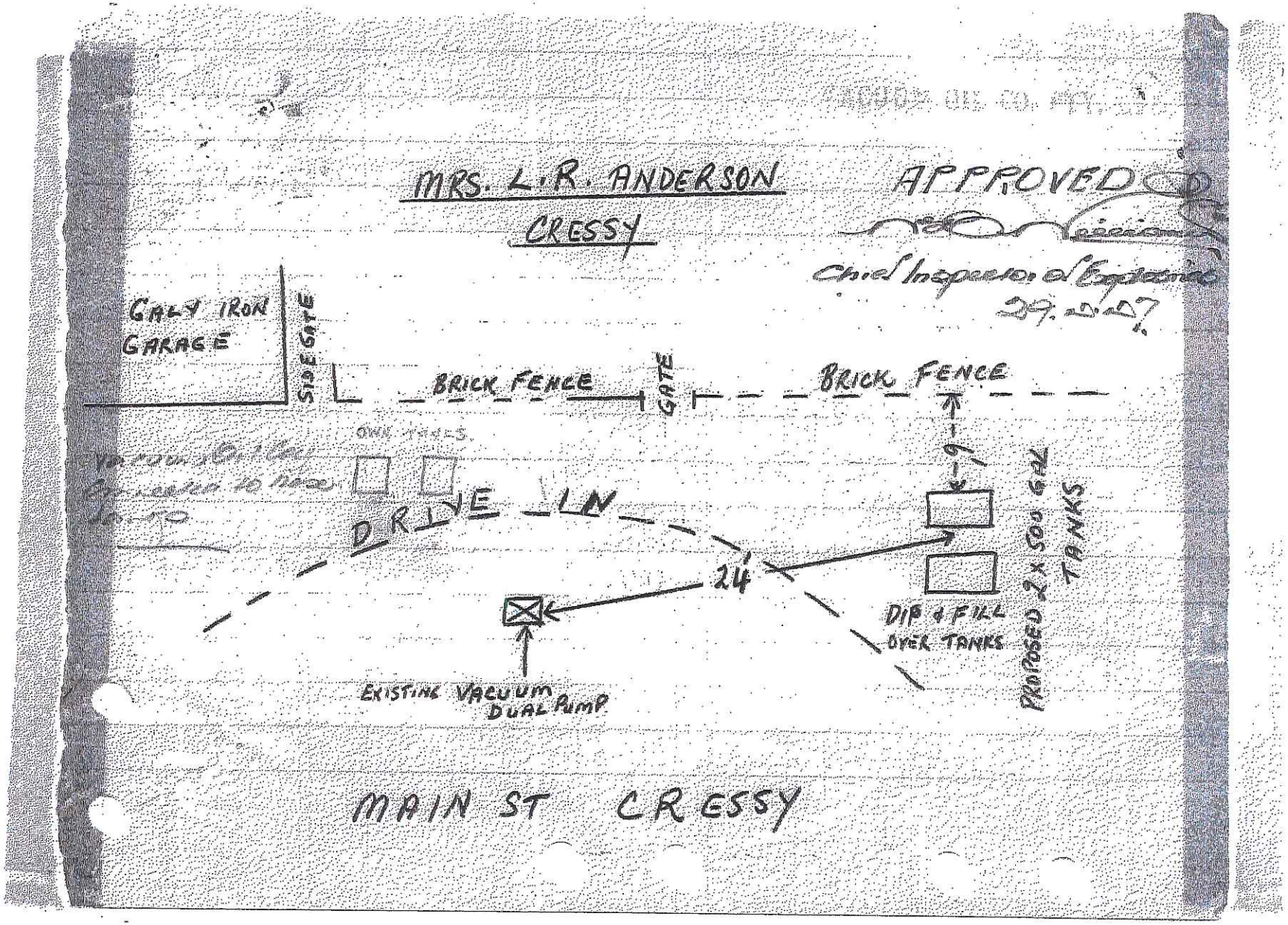
On 30th October, 1947, we wrote to your Launceston Inspector, Mr. R.J. Muir, requesting authority for the installation of a Shell Dual reseller outfit, with two 500-gallon tanks, for the abovementioned at Cressy. At the same time, we wrote the Longford Council for their approval.

The Council approval was received on 14th November, 1947, but as we had not received any reply to our application to your Department, we again wrote Inspector Muir on 17th March, 1948. His reply has now been received, and he states that he forwarded his recommendation to you on 4th November last, but that he has heard nothing further.

As we do not appear to have received any indication from you as to whether our application was finally approved or rejected, we presume that the matter has not yet been dealt with, and as the installation is now urgently required, we would appreciate your advice at your earliest opportunity.

Yours faithfully,
For THE SHELL COMPANY OF AUSTRALIA LIMITED,

R. M. Lee


MRS. L.R. ANDERSON
CRESSY
APPROVED
Chief Inspector of Explosives
29.10.07
GALY IRON GARAGE
SIDE GATE
BRICK FENCE
GATE
BRICK FENCE
DRIVE IN
24
DIP & FILL OVER TANKS
PROPOSED 2 x 500 GAL TANKS
EXISTING VACUUM DUAL PUMP
MAIN ST CRESSY

2215"....52 (11)

Tasmania.

TELEPHONES:
LABORATORY 845
REGISTRAR OF MINES ....' 691
INSPECTOR OF MINES AND EXPLOSIVES 373
G.P.O. Box, 225.

Inspector of Mines, Magazines, and Explosives Office,
Public Buildings,

Launceston, 4th November, 1947.

MEMORANDUM:

Enclosed please find application by the Shell Company of Australia Ltd., on behalf of Mrs. L. R. Anderson, Cressy, for the installation of a dual reseller petrol pump with two 500-gallon tanks attached.

From the sketch plan submitted the application appears in order and is submitted for your approval.

INSPECTOR OF EXPLOSIVES.

The Chief Inspector of Explosives,
Hobart.

E.C.

30th April, 1947.

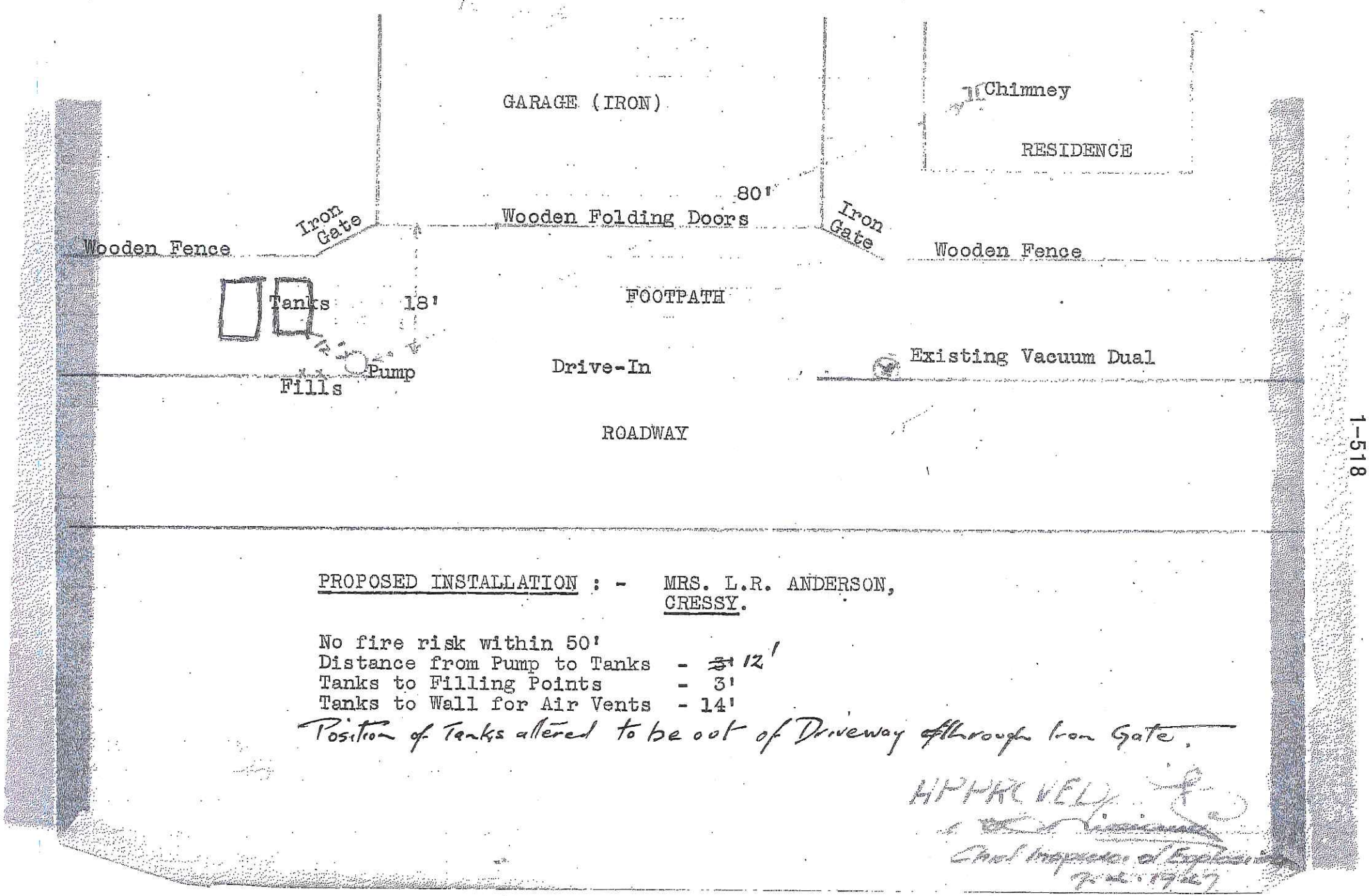
Dear Sir,

Permission is granted for the installation of two 500-gallon underground tanks to be connected with an existing dual pump at the premises of Mrs. L. R. Anderson, Cressy, conditionally that the tanks are not in a trafficway to be within the influence of vehicular traffic, unless they are concrete rafted, and outside the point of servicing of motor vehicles. It is assumed that the old tanks will be placed out of commission, that the new tanks will be sited in accordance with the submitted sketch and that the installation will conform with the provisions of the Inflammable Liquids Act.

Yours faithfully,

CHIEF INSPECTOR OF EXPLOSIVES.

The Manager,
Vacuum Oil Co. Pty. Ltd.,
T. & G. Buildings,
HOBART.



PROPOSED INSTALLATION : - MRS. L.R. ANDERSON, CRESSY.

No fire risk within 50'
Distance from Pump to Tanks - ~~3~~ 12'
Tanks to Filling Points - 3'
Tanks to Wall for Air Vents - 14'

Position of Tanks altered to be out of Driveway through Iron Gate.

APPROVED
for Chief Inspector of Explosives
7.10.1957

1-518

NEPTUNE OIL CO. PTY LTD.

(INCORPORATED IN NEW SOUTH WALES)

CABLE & TELEGRAPHIC ADDRESS "NEPOL"
TELEPHONES: HOBART 5716, LAUNCESTON 713
BOX 543 F G.P.O. HOBART

COLONIAL MUTUAL LIFE BUILDINGS
ELIZABETH STREET
HOBART, TAS.

C/N

20th. March, 1947.

Mr. R.J. Muir,
Inspector of Explosives,
Department of Mines,
LAUNCESTON.

Dear Sir,

PROPOSED INSTALLATION : MRS. L.R. ANDERSON, CRESSY.

We attach hereto triplicate copies of sketch showing the proposed installation of a Waratah dual reseller outfit, with a tank capacity of 1,000 gallons, for the abovementioned at Cressy.

A similar communication has today been addressed to the Longford Council, and we trust that this application will meet with your approval.

Yours faithfully,
For NEPTUNE OIL COMPANY PTY. LTD.,

HOBART

1–520

Application for Licence for Underground Tank.

2928

10/-

13/10/38

1. Applicant's full name Erma Mary Florence.
2. Applicant's calling or occupation Housewife.
3. Applicant's postal address Cressy.
4. Date of installation January 15th & 17th approx.
5. Situation of store to be licensed Main Street Kerbside Pump.
6. Name of municipality, town, or township within which, or within 5 miles of which, the store is situated Cressy: Longford Municipality.
7. Total quantity (in gallons) of mineral spirit to be stored 1000
8. Number of tanks to be installed ~~Two~~ ONE.
9. Total number of tanks installed TWO.
10. Is tank or pump inside any building? No.
11. If so, state construction of building —
12. How near is the nearest protected works? Iron Garage 15 feet.
13. Have you provided approved fire-extinguishers? Yes.
14. Is each depot so situated as not to be within 50 feet of any fire, forge, furnace, explosive, highly inflammable substance, or other source of danger? Yes.
15. Is each tank at least 2 feet underground? Yes.
16. Are all tank vents clear above building, or 12 feet above ground where in the open? Yes
17. Has your installation been approved by an inspector?
18. Name of maker of tank and pump Wayne.
19. Capacity of tank 500
20. Are all junctions of electric wires in gas tight junction-boxes? Yes.
21. Are all switches and fuses a safe distance from pump? Yes.
22. Have you attached approved notices, "No smoking—Stop your Engine," to pump-heads? Yes.

I declare that the above statements and answers are true to the best of my knowledge and belief.

Signed Erma Whitchurch

Dated this Tenth day of August, 1938.

Satisfactory. If No Smoking on pump. MDWandle(?) Inspector of Explos. 12.10.38

1-521

48282

TASMANIA

Phone 845.

Inspector of Mines and Explosives,

Mines Office,

Launceston, 18th: April, 1935.

MINES DEPARTMENT
No.
24 APR 1935
HOBART

J. O. Hudson Esq:,
Chief Inspector of Explosives,
H O B A R T.

Dear Sir,

Permission has been granted Cyril F. Whitchurch, Cressy, to install a kerbside petrol pump with a tank capacity of 500 gallons.

Yours obediently,

INSPECTOR OF ~~EXPLOSIVES~~.

Chief Inspector of Explosives
Hobart.

Penny Garage.
Bay. 24-3.

Dear Sir

In reference to your request for a rough plan of the installation of a Petrol pump & tank —

I must apologise having failed to forward this previously, but somehow your letter was mislaid and eventually quite overlooked.

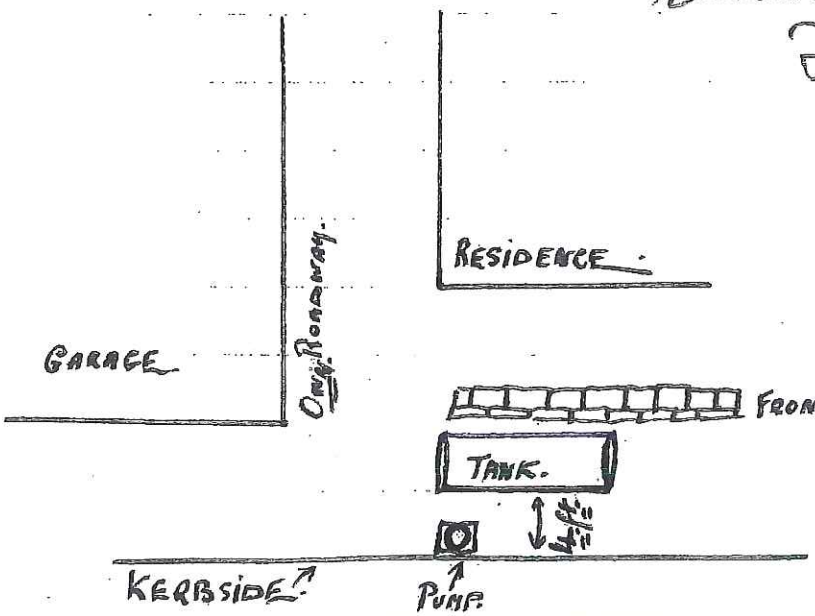
Mr. Williams from Launceston came out and personally measured up distances etc, and issued instructions as to the installation generally, these have been conformed with, and a rough sketch is given at the foot hereof.

Trusting this is quite to your satisfaction and thanking you.

Believe me

Faithfully yours.

Cyril J. Ditchburn.



"The Inflammable Liquids Act, 1929."

1-523

Application for Licence for Underground Tank.

MINES DEPARTMENT No. -4 MAY 1935 HOBART

1. Applicant's full name Cyril Frederick Whitchurch.
2. Applicant's calling or occupation Garage Proprietor.
3. Applicant's postal address Cressy.
4. Date of installation April 1935.
5. Situation of store to be licensed Main Street.
6. Name of municipality, town, or township within which, or within 5 miles of which, the store is situated Longford Municipality. Township Cressy.
7. Total quantity (in gallons) of mineral spirit to be stored 500 maximum.
8. Number of tanks to be installed One.
9. Total number of tanks installed Nil.
10. Is tank or pump inside any building? No.
11. If so, state construction of building —
12. How near is the nearest protected works? Roadside outlet
13. Have you provided fire-extinguishers? Yes.
14. Is each depot so situated as not to be within 50 feet of any fire, forge, furnace, explosive, highly inflammable substance, or other source of danger? Yes.
15. Is each tank at least 2 feet underground? Yes.
16. Are all tank vents clear above building, or 12 feet above ground in the open? Yes.
17. Has your installation been approved by an inspector? Yes.
18. Name of maker of tank and pump Tasco Engineering Products Ltd. (EPEX).
19. Capacity of tank 500.
20. Are all junctions of electric wires in gas tight junction-boxes? Yes.
21. Are all switches and fuses a safe distance from pump? Yes.

I declare that the above statements and answers are true to the best of my knowledge and belief.

Signed Cyril F. Whitchurch.

Dated this First. day of April., 1935.

(This application with a fee of £1 to be forwarded to Secretary for Mines, Hobart.)

Issue of Licence approved. 4 May 1935

BOREHOLE LOG

Borehole No:	Fuel 1	Client:	Environmental Service & Design
Logged By:	AM	Project:	Contamination Investigation
Date:	20/07/2020	Locality:	77 Main Street, Cressy
Notes: See attached		Drill Model:	Drilltech
		Hole Dimensions:	150mm

Method	Support	Penetration Rate	Water	Samples	DCP	Depth	Classification Symbol	Material Description	Moisture	Consistency	Notes
DC	N							CONCRETE			slab
AF							SM	SILTY SAND - fine-grained, orange grey	W M	L	hydrocarbon odour
						0.5		Borehole terminated @ 0.4m depth due to exposure of steel pipe			
						1.0					
						1.5					
						2.0					
						2.5					
						3.0					
						3.5					
						4.0					
						4.5					
						5.0					

BOREHOLE LOG

Borehole No:	Fuel 2	Client:	Environmental Service & Design
Logged By:	AM	Project:	Contamination Investigation
Date:	20/07/2020	Locality:	77 Main Street, Cressy
Notes: See attached		Drill Model:	Drilltech
		Hole Dimensions:	150mm

Method	Support	Penetration Rate	Water	Samples	DCP	Depth	Classification Symbol	Material Description	Moisture	Consistency	Notes
JH	N							CONCRETE			slab
HA							GP	SANDY GRAVEL - coarse-grained	M	L	FILL
						0.5	CH	SILTY CLAY - high plasticity, dark grey mottled yellow	M	St	hydrocarbon odour
								light grey mottled yellow			
								grey mottled red and yellow			
						1.0				VSt	
AF											
						1.5		grey mottled yellow			
						2.0					
								light grey mottled red and yellow			
						2.5					
						3.0					
						3.5					
						4.0					
								Borehole terminated @ 4.0m depth			
						4.5					
						5.0					

BOREHOLE LOG

Borehole No:	Bowser 1	Client:	Environmental Service & Design
Logged By:	AM	Project:	Contamination Investigation
Date:	20/07/2020	Locality:	77 Main Street, Cressy
Notes: See attached		Drill Model:	Drilltech
		Hole Dimensions:	150mm

Method	Support	Penetration Rate	Water	Samples	DCP	Depth	Classification Symbol	Material Description	Moisture	Consistency	Notes
AF	N						SM	SILTY SAND - fine-grained, orange-brown	M W	L	FILL
							CH	SILTY CLAY - high plasticity, grey	M	St	hydrocarbon odour
						0.5					
								grey mottled yellow		VSt	
						1.0		grey mottled red and yellow			
								light grey mottled red and yellow			
						1.5		light grey mottled yellow			
						2.0					
								Borehole terminated @ 2.0m depth			
						2.5					
						3.0					
						3.5					
						4.0					
						4.5					
						5.0					

BOREHOLE LOG

Borehole No:	Bowser 2	Client:	Environmental Service & Design
Logged By:	AM	Project:	Contamination Investigation
Date:	20/07/2020	Locality:	77 Main Street, Cressy
Notes: See attached		Drill Model:	Drilltech
		Hole Dimensions:	150mm

Method	Support	Penetration Rate	Water	Samples	DCP	Depth	Classification Symbol	Material Description	Moisture	Consistency	Notes
AF	N						SM	SILTY SAND - fine-grained, orange-brown	M	L	FILL hydrocarbon odour
								grey	W		
							CH	SILTY CLAY - high plasticity, grey mottled red and yellow	M	St	
						0.5				VSt	
						1.0					
						1.5		light grey mottled yellow			
						2.0					
								Borehole terminated @ 2.0m depth			
						2.5					
						3.0					
						3.5					
						4.0					
						4.5					
						5.0					

BOREHOLE LOG

Borehole No:	Bowser 3	Client:	Environmental Service & Design
Logged By:	AM	Project:	Contamination Investigation
Date:	20/07/2020	Locality:	77 Main Street, Cressy
Notes: See attached		Drill Model:	Drilltech
		Hole Dimensions:	150mm

Method	Support	Penetration Rate	Water	Samples	DCP	Depth	Classification Symbol	Material Description	Moisture	Consistency	Notes
AF	N						SM	SILTY SAND - fine-grained, orange-brown	M W	L	FILL
						0.5	CH	SILTY CLAY - high plasticity, grey mottled red and yellow	M	VSt	hydrocarbon odour
						1.0					
						1.5		light grey mottled red and yellow			
						2.0					
								Borehole terminated @ 2.0m depth			
						2.5					
						3.0					
						3.5					
						4.0					
						4.5					
						5.0					

BOREHOLE LOG

Borehole No:	SP1	Client:	Environmental Service & Design
Logged By:	AM	Project:	Contamination Investigation
Date:	20/07/2020	Locality:	77 Main Street, Cressy
Notes:	Page 1 of 2 See attached	Drill Model:	Drilltech
		Hole Dimensions:	150mm

Method	Support	Penetration Rate	Water	Samples	DCP	Depth	Classification Symbol	Material Description	Moisture	Consistency	Notes
JH	N							CONCRETE			slab
							GP	SANDY GRAVEL - coarse-grained	M	L	FILL
AF						0.5	CH	SILTY CLAY - high plasticity, grey mottled red and yellow	M	VSt	
						1.0					
						1.5		light grey mottled yellow			
						2.0					
						2.5					
						3.0					
						3.5		grey mottled black, red and yellow			hydrocarbon odour
						4.0					
						4.5					
			▽			5.0		continued on page 2			

BOREHOLE LOG

Borehole No:	SP1 cont.	Client:	Environmental Service & Design
Logged By:	AM	Project:	Contamination Investigation
Date:	20/07/2020	Locality:	77 Main Street, Cressy
Notes:	Page 2 of 2 See attached	Drill Model:	Drilltech
		Hole Dimensions:	150mm

Method	Support	Penetration Rate	Water	Samples	DCP	Depth	Classification Symbol	Material Description	Moisture	Consistency	Notes
AF	N					5.5		SILTY CLAY continued	M	VSt	cemented layer
						6.0		Borehole terminated @ 6.0m depth			
						6.5					
						7.0					
						7.5					
						8.0					
						8.5					
						9.0					
						9.5					
						10.0					

BOREHOLE LEGEND

Method:	AF	Continuous Flight Solid Stem Auger with Fishtail Bit
	DC	Diamond Coring
	JH	Jackhammer
	HA	Hand Auger
Support:	N	None
Water:	▶	Seepage
	▽	Standing Water Level
Samples:	D	Disturbed Sample
	U50	Undisturbed Tube Sample 50mm diameter
	U63	Undisturbed Tube Sample 63mm diameter
Moisture:	D	Dry
	M	Moist
	W	Wet
Consistency:	L	Loose
	MD	Medium Density
	D	Dense
	S	Soft
	F	Firm
	St	Stiff
	VSt	Very Stiff
Tests:	V	Vane Shear Strength
	DCP	Dynamic Cone Penetrometer
	PP	Pocket Penetrometer

Notes on Drilling at 77 Main Street, Cressy, 20 July 2020

- There was an existing commercial building on site.
- The borehole drilling and sample collection were supervised by Carmel Parker of Environmental Service & Design.
- Groundwater seepage was encountered in Borehole SP1 at 5.5m depth. The depth of standing water in SP1 was measured at 5.0m depth shortly after drilling.
- Soil composition was classified using field techniques. Composition should be considered preliminary and may need to be verified by laboratory analysis.
- The borehole data and observations represent subsurface conditions at discrete points where samples and measurements were taken. Conditions may vary between points or with time. Drilltech Environmental and Geotechnical, its proprietor, employees and subcontractors are not responsible for interpretations of the data by other parties.

Rod Cooper 2:51 PM (16 minutes ago)

to me

---------- Forwarded message ---------
From: **Gill Rasmussen** <grasmussen@esandd.com.au>
Date: Thu, 28 May 2020 at 15:18
Subject: Cressy photos 27/5 and sampling notes
To: <rcooper@esandd.com.au>

Attached were taken on 27/5 when soil was sampled. Note one of the photos shows the side that started to collapse so the soil was returned to the pit. Also two pages showing the tank atmospheric test results.

Notes
Arrived at site at 9.30 am 27/5 per client instructions. There was an ambient hydrocarbon odour at the site. Ambient gas readings were as follows:

CO2 250 ppm
H2S 0ppm
O2 20.9 %
CO 0 ppm
LEL 0 %

VOC reading over the excavated pit was 0.1 ppm
Temporary soil stockpile 0.6 ppm
The temporary stockpile was from the Tank 1 pit. Re-excavation of that side of the pit was in progress when I arrived. Site surfaces comprise a large concrete area which is not in particularly good condition with some grassed / garden areas.

Excavation works were carried out by Gavandy Contracting (Gavin Tapp), engaged by the party intending to purchase the site, Calton Dixon. Mr Tapp was unsure of the name of the current site owner, but thought it might be Helen Williams. Tanks were still on site and were in good condition with no rust or holes. Tank 1 capacity is 10,000L, Tank 2 capacity 5,000L. Large tank constructed of thicker steel (8-10mL compared to 6mL for the smaller one).

Photos from previous day show a small amount of water in pit but no groundwater entered the pit after re-excavation and sampling on 27/5. A seep from high up in the pit wall on the north east side appeared to be coming from a down pipe on the front verandah of the neighbouring house. Excavator driver had filled in pits after tank removal the previous day

because he was concerned about wall collapse (see photo).

The pits were re-excavated to a depth of 2.3m BGSL, the calculated depth of the tank bases and samples were taken according to the attached sketch from the base of each pit. There was a concrete slab at the bottom of the Tank 1 pit. Sample descriptions and PID readings included in a table in the same file. Stiff grey clay divided the two pits. Soil from Tank 1 pit was placed to the side of the pit on the concrete apron and samples were collected. Soil from the Tank 2 pit was temporarily placed into the Tank 1 pit while samples were collected from the Tank 2 pit. The Tank 2 pit soil was then immediately returned to the Tank 2 pit, then the Tank 1 pit soil was returned to its corresponding pit. A similar procedure was conducted when removing the tanks on the previous day, hence at no stage was the soil considered as stockpiled and therefore stockpile samples were not taken. Because of this moving around of soil there is no certainty that any of the samples are representative of conditions at the base of the tanks before removal.

Let me know if you need any more info.

Cheers
Gill

Project No: 7186
Address: 77 Main St Cressy

Investigation Date: 20/07/20.

JMG Engineers & Planners

FIELD LOG

GPS Ref / Photo (P)	S.Point	Depth mbgs	Sample ID & Depth	Material Description	Observations: odour, staining, colour	Consistency: (VL to VD)	M: (D,M,W)	PID: (ppm)
	Fuel 1	0-0.4	Fuel 1 - 0.4m 9:18	Concrete to 0.2m then yellow clay to 0.3 then grey stained sand to 0.4m over fuel line.	odour + stain	L	M	18.0
	Fuel 2	0-0.6	Fuel 2 - 0.6m 9:46	Concrete 0-0.15, then mottled clay heavy to 0.6m, clay green colour with slight odour to 1.0m - (0.15 to 1.0m natural)	odour + stain	VD	D-M	3.0
	SB1	0-0.5	SB1 - 0.5m 10:39	Concrete to 0.1m then heavy mottled clay. Slight odour from 0.3m	Slight HC odour / no stain	VD	D-M	0.0
		0.5-1.0	SB1 - 1.0m 10:45	Heavy mottled clay - very stiff	" " / No stain.	VD		0.0
		1.0-2.0	SB1 - 2.0m 10:47	Mottled clay to 1.7 then white clay from 1.7	Slight HC odour	VD		0.0
		2.0-3.0	SB1 - 3.0m 10:52	White heavy clay - slight odour	" " " / No stain.	VD		1.2
		3.0-4.0	SB1 - 4.0m 11:09	White heavy clay - slight HC odar/sweet?	HC odour/sweet	VD		0.5
		4.0 to 6.0		White/red mottled clay	No odour	VD		0.0
				Water in hole at 5.0m after 1 hr	No staining	VD		
	Fuel 2	0.6-1.0		Mottled clay - V.S.	odar + stain.	VD	V	1.0
		1.0-2.0	Fuel 2 - 2.0 12:18	Soft grey clay	Slight HC odour	M-VD	M	1.7
		2-3.0	~~SB~~ Fuel 2 - 3.0A	Grey stiff clay - no stain but strong volatile odour	Strong odour		M.	
			Fuel 2 - 3.0B 12:30	" " " " " "				25.1
		3-4.0	Fuel 2 - 4.0 12:39	" " " " " "				33.3
	Bore 3	0.5-1.0		Sand to 0.45 (Fill) then soft clay	Very Strong HC odour.	L	M	446.7
				Strong odour from 0.5		L	M	
		1.0-2.0		Soft brown clay then white clay	odour HC	M-D	M	82.0 @
				very strong odour @ 1.0 then reducing at 2.0	Reducing at 2.0m.	M-D	M	2

1-535

Project No: 7186

Investigation Date: 20-07-20.

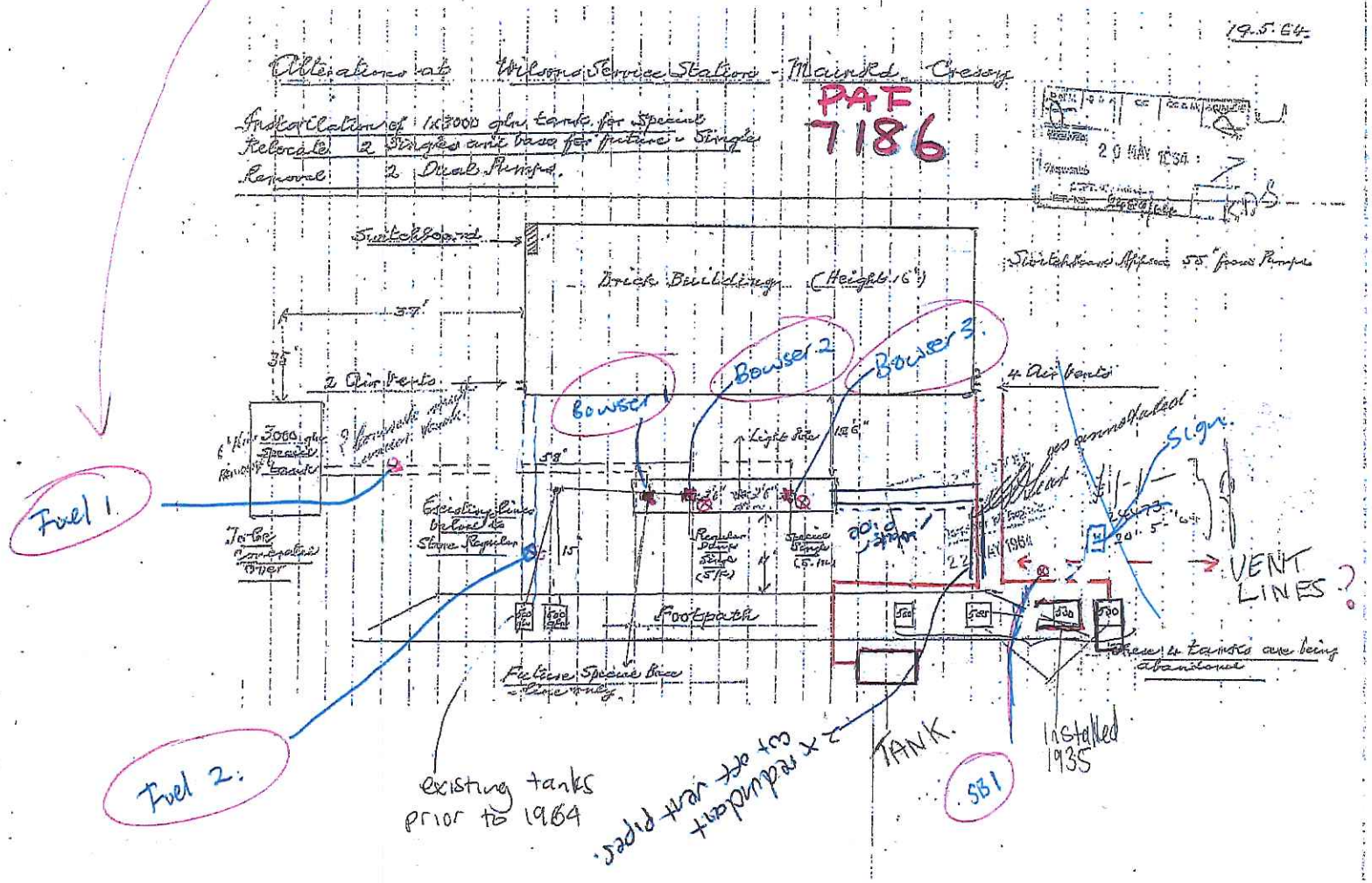
Address: 77 Main Street Cressy

FIELD LOG

Location ID	Depth mbgs	Sample ID & Depth	Material Description: MAJOR (SAND, CLAY, FILL etc) Minor (Sand, Clay, Fill, Top Soil)	Contaminant Indicators: (Observations, odour, staining)	Consistency: (VL, L, MD, D, VD)	Moisture: (D, M, W)	PID (ppm)
Bowser 2	0 - 1.0	Bowser 2 - 1.0m 1:25	Sand (Fill) to 0.5 then mottled clay	Strong odour / s	L - VD	D	303 @ 1.0
		Bowser 2 - 1.8 1:28	Mottled clay	" " "	VD	D	281 @ 1.8
Bowser 1	0 - 1.0	Bowser 1 - 0.5 1:36	Sand (Fill) to 0.3m then mottled clay	" " "	VD	D	180 @ 0.5m
	1.0 - 2.0	Bowser 1 - 2.0 1:41	Mottled clay to 2.0m Odour reducing from 2.0m.	" " "	VD	D	19.6 @ 2.0m
				Slight odour @ 2.0m.			

1-536

Sampling Points completed 20 July 2020 7186
77 Main St Cressy



1-537

1-538

Project No: 7186 Investigation Date 06-08-20 P1 of 3.

Address: 77 Main Street Cressy - Removal of fuel lines, vent pipes and sample under bowsers.

FIELD LOG

0-0.9 fill

Location ID	Depth mbgs	Sample ID & Depth	Material Description: MAJOR (SAND, CLAY, FILL etc) Minor (Sand, Clay, Fill, Top Soil)	Contaminant Indicators: (Observations, odour, staining)	Consistency: (VL, L, MD, D, VD)	Moisture: (D, M, W)	PID (ppm)
			Concrete over fuel line had been				
Fuel A	0-0.4		removed both sides of the bowser	Sandy Clay			
			pad. Excavated trench to 0.3m	Black Stain/Odour	L	M	650 0.3
			Excavated to ~~0.45~~ 0.4m Staining	Gravelly Clay	L-M	M	499 0.4
			disappearing				
	0.4-0.6	Fuel A-0.6m 1:21	Un-covered vent pipes at end	" Gravelly clay	L	M	610 0.6A
			Removed additional 200mm all way				
Fuel B	0-0.6	Fuel B-0.6m 1:45	along the trench		L	M	590 0.6B
			In one place in trench removed up to	HC Odour	L-M	M	520
			0.9m - Mottled Clay				
	0.6-1.2	Fuel B-1.2m 2:30	@ 1200mm - Mottled Clay				120 @ 1.2m
			Natural ground slight odour	Slight HC odour	L-M	M	
				No staining.			
Bowser 3	0.6	~~Bowser 3-0.6m~~	Strong HC Odour				820 @ 0.6
					L-M	M	
Bowser 3	1.0		" " " Mott Clay (Natural)				250 @ 1.0
	1.1		Slight HC Odour Mottled Clay	Slight			180 @ 1.2m
Bowser 3	1.7		Slight " " Mottled Clay	Slight			227 - 1.7m
	~~2.1~~	3:28					330 - 1.8m
	2.1	Bowser 3 - 2.1m	Grey mottled clay - slight HC odour	HC odour	VD	D	660 - 2.1
							470 - 2.1
							423.
SB1	0.5	SB1-0.5m		Slight	M	M	9.6
		SB1-1.0m		Strong HC Odour	D	M	590
		SB1-1.3 4:30	Grey clay from 1.2	Slight HC odour	VD	M	30.4 - 1.3
		SB1-1.5 4:03	Grey clay with rock, Shale.	Slight (very)	VD	D.	14.0 - 1.5

Fill [0 - m sandy gravel / clayey sand / sand clay | Loose material.

0.9 - mottled Clay | moderate

Nat. [2.0 ...

Project No: 7186 Investigation Date: 07-08-20

Address: 77 Main Street Cressy

FIELD LOG

Location ID	Depth mbgs	Sample ID & Depth	Material Description: MAJOR (SAND, CLAY, FILL etc) Minor (Sand, Clay, Fill, Top Soil)	Contaminant Indicators (Observations, odour, staining)	Consistency (VL, L, MD, D, VD)	Moisture (D, M, W)	PID (PPM)	Depth
	SB2.	SB2-1.0m 10:08	Fill sand/clay mixture. rags in fill at 0.5m, Stain under cover	HC odour	L-M	M	10@0.2 82@1.0	
	SB4.	SB4-1.1m 10:20	Fill sand/clay mixture & rags at 1.0m. Stain from under concrete to 0.3m	Slight HC Odar	L-M	M	0.5-0.2m 0.2-0.1m 0.1-1.1m	
	~~SB3~~							
	SB3	SB3-1.0m 10:38	Concrete, then gravelly sand to 0.3 (fill) then sand/clay mix to 1.0m	Slight HC Odour Stain 0-0.3	L	M	2.6-0.2m 1.3-0.5m	
	SB3	SB3-0.3m 10:35	(fill). Natural from ~~0.3~~ 0.7m mottled clay with shale/rock from 0.7 to 1.0m mixed with high density clay.	under concrete	L-M V D@0.7	M M	0.9-~~0.5m~~ 1.0m	
	SB5	SB5 SB5-0.3 10:55 SB5-1.0m 11:05	Concrete then - sandy gravel stained to 0.3m then clayey Sand ~~then~~ to 0.9m then grey heavy clay from 0.9 to 1.0m	HC odour Sweet phenolic odour at 1.0m.	L M VD@0.9	M M M	15.5-0.3 14.0-1.0m	
	SB6	SB6-0.1.0m 10:23	0-0.3 underconcrete blade stain appears to be organic? - no odour - possibly because soil under concrete wet	Slight organic odour?			0.3@0.3m 0.5-1.0m 0.1-1.5m	
		~~SB7~~						
	SB7	SB7-0.5 11:30	clayey sand under concrete	No odour	M	M	0.5-0.5m 0.2-1.0m	

1-539

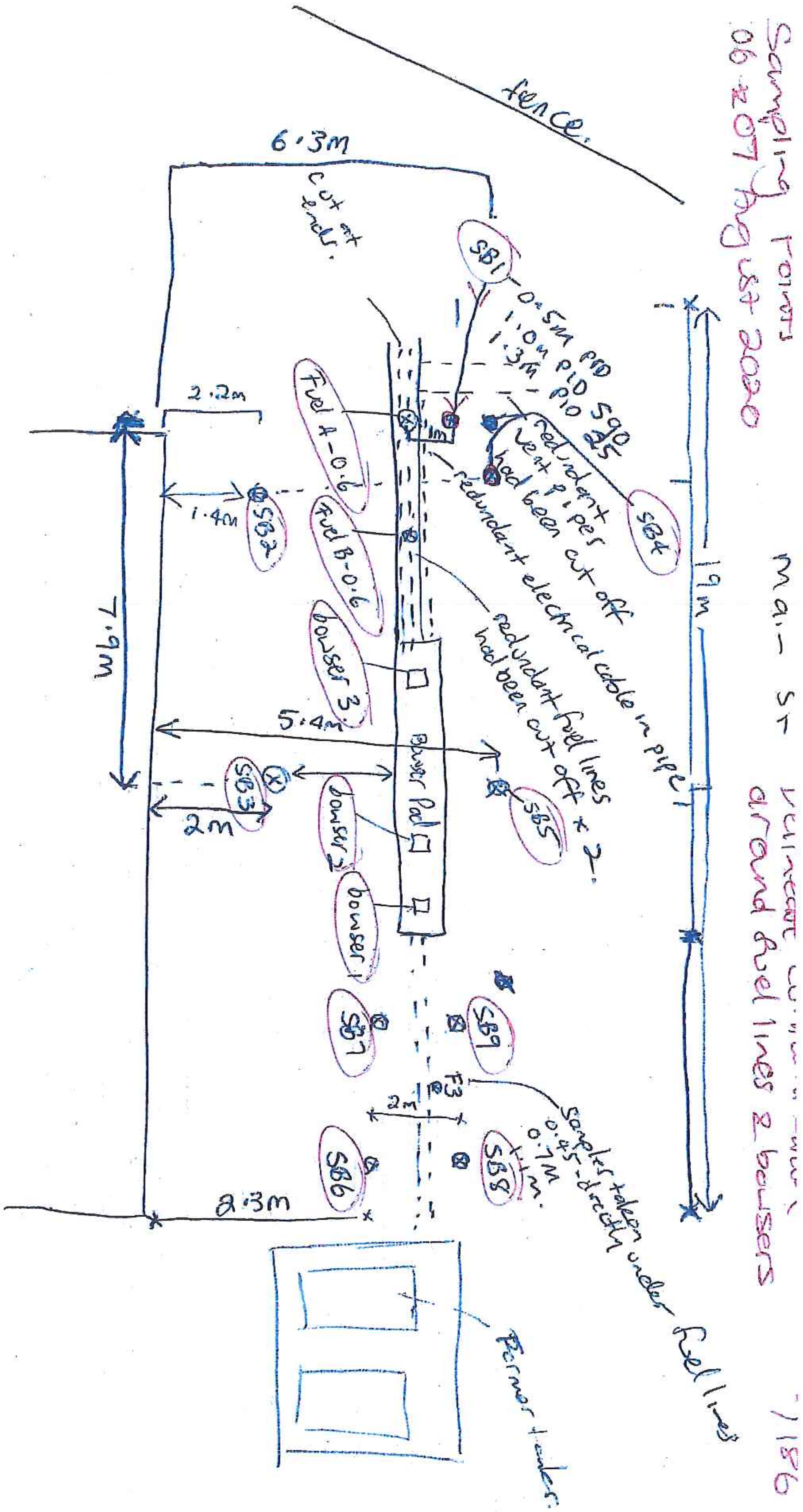
Project No: 7186
Address: 77 Main St

Investigation Date: 07-08-20

FIELD LOG

Location ID	Depth mbgs	Sample ID & Depth	Material Description (MAJOR (SAND, CLAY, FILL etc) Minor (Sand, Clay, Fill, Top Soil))	Contaminant indicators (Observations, odour, staining)	Consistency (VL, L, MD, D, VD)	Moisture (D, M, W)	PID (ppm)
SB8	0-0.2		Black staining under concrete to	Organic odor?	L	M	0.2 - 0.2
	~~SB~~-0.5	~~SB~~SB8-0.5m 11:40	0.2m. Organic odour. But	Odour - organic	L-M	M	0.4 - 0.5m
	0.5-1.0		at 0.3m slight HC odor	HC Odor very slight	L-M	M	0.1 - 1.0m
			Mottled clay from 0.9				
			Fill 0 to 0.9m Gravelly Sand				
			Mixed with clay/sand.		D	M	
SB9	0-0.2		Concrete then gravelly sand to 0.2m		L	M	0.2 - 0.2m
	0.2-0.5	SB9-0.5m A 11:54	Sandy clay from 0.2 to 0.5m fill		L-M		1.8 - 0.5m
		SB9-0.5m B 11:54		possible HC odour	L-M		1.8 - 0.5m
	0.5-1.0	SB9-1.0m 11:58	Sandy clay to 0.7 (fill) possible HC		D		0.1 - 1.1m
			mottled clay from 0.7-1.0m				
F3		F3		Very strong HC odour	L	M	*
			Fuel lines buried at 0.4				
		F3-0.5 12:23	PID under fuel line 1004 ppm				1004 - 0.4
			going up still				
		F3-0.7m 12:24	Sand fill under lines		L	M	
			Beside fuel line @ 0.4				178 - 0.7
		F3-1.1m 12:37	Heavy grey clay from 1.0m	Reducing HC odour at 1.1m	VD	D	10.1 - 1.1

1-540


Sampling Points
06 & 07 August 2020
around fuel lines & bowsers
fence.
6.3m
SB1
0.5m PID
1.0m PID
1.3m PID
SB4
redundant vent pipes had been cut off
redundant electrical cable in pipe
redundant fuel lines had been cut off x 2.
Fuel A-0.6
Fuel B-0.6
2.2m
1.4m
SB2
7.9m
bowser 3
5.4m
Bowser Pad
SB3
2m
SB5
bowser 2
bowser
19m
SB7
SB9
F3
2m
SB8
SB6
2.3m
Samples taken under fuel lines
0.45-depth
0.7m
Former tanks
7186

Project No: 7186 Investigation Date: 26-08-20

Address: 77 Main St - Validation Samples around SB2/4

FIELD LOG

Location ID	Depth mbgs	Sample ID & Depth	Material Description: MAJOR (SAND, CLAY, FILL etc) Minor (Sand, Clay, Fill, Top Soil)	Contaminant Indicators: (Observations, odour, staining)	Consistency (VL, L, MD, D, VD)	Moisture (D, M, W)	PID (ppm)
			Initial excavation 1.2m D x 3.5m W x 3.6m L				
wall/base	1.2	VB1 - 1.2m 3:31	Base had odar and green stain particularly on roadside	Strong HC Odour	MD	M	101 500@1.75
wall/base	1.2.	V2 - 1.2m 3:32	"	"	MD	M	500
wall/base	1.2	V3 - 1.2m 3:34	Excavated a further 500mm at centre of pit (base).	"	MD	M	480
base	1.6	V4 - 1.6m 3:44		"	MD	M	770
base	1.5	V5 - 1.5m 3:56	~~Took~~ Collected soil samples from walls at 1.2 (base of walls) original depth and base	" green stain.	MD	M	530
base	1.75	V6 - 1.75m 4:09	at 1.2m then also base at 1.75m once grey heavy clay was encountered	No odour / SO 1.75	VD	M/D	10@1.75
			Soil Profile Description.				
			- Dark brown sand clay 0-0.2m		L	M	
			- Mottled orange soft clay 0.2 to 1.0m	Mild / Strong HC	MD	M	
			- Shale crumbly from 1.0 to 1.5/1.75.	some odour	L	M	
			- Very Dense Grey Clay from 1.75m.	~~no odour~~	VD		

1-542

Project No: 7186

Address: 77 Main St Cressy

Investigation Date: 10-09-20

JMG Engineers & Planners

FIELD LOG

GPS Ref / Photo (P)	S.Point	Depth mbgs	Sample ID & Depth	Material Description	Observations (odour, staining, colour)	Consistency (VL to VD)	M (D,M,W)	PID (ppm)
	V7	1.2	V7-1.2m	Wall sample - orange/mottled heavy clay	Hc odour slight	VD	M	10.1
	V8	0.6	V6-0.6m	wall sample - orange clay	slight HC odour	VD	M	0.1
	V9	0.9	V9-0.9m	wall sample - orange clay	"	VD	M	0.4
	V10	0.8	V10-0.8m	wall sample - orange clay	"	VD	M	1.2
	V11	1.2	V11-1.2m	wall sample - orange clay	"	VD	D	1.2
	V12	1.5	V12-1.2m	wall sample - orange clay.	"	VD	D	21.2
Base	V13	1.5	V13-1.5m	Base sample @ 1.5 orange clay	"	VD	D	15.9
	V14	1.0	V14-Base 1.0	Base @ 1.0m orange clay	"	VD	M	7.2
	V15	1.2	V15-1.2	Base sample @ 1.2m	"	VD	M	2.1
	V16	1.0	V16-1.0	Wall	"	VD	M	0.2

1-543

Submission to Planning Authority Notice

Council Planning Permit No.	PLN-21-0020	**Council notice date**	11/03/2021
TasWater details			
TasWater Reference No.	TWDA 2021/00386-NMC	**Date of response**	17/03/2021
TasWater Contact	Al Cole	**Phone No.**	0439605108
Response issued to			
Council name	NORTHERN MIDLANDS COUNCIL		
Contact details	Planning@nmc.tas.gov.au		
Development details			
Address	77-79 MAIN ST, CRESSY	**Property ID (PID)**	6749768
Description of development	Visitor Accommodation, 2 lot subdivision, demolish shed		

Schedule of drawings/documents

Prepared by	Drawing/document No.	Revision No.	Date of Issue
Woolcott Surveys	Proposed Subdivision	1.0	21/07/2020

Conditions

Pursuant to the *Water and Sewerage Industry Act* 2008 (TAS) Section 56P(1) TasWater imposes the following conditions on the permit for this application:

CONNECTIONS, METERING & BACKFLOW

1. A suitably sized water supply with metered connections and sewerage system and connections to each lot of the development must be designed and constructed to TasWater's satisfaction and be in accordance with any other conditions in this permit.

   Advice: Plans submitted as part of an application for a Certificate for Certifiable work (Building and/or Plumbing) will need to show the exact location of the exsiting property water and sewer connections.

2. Any removal/supply and installation of water meters and/or the removal of redundant and/or installation of new and modified property service connections must be carried out by TasWater at the developer's cost.

3. Prior to commencing construction of the subdivision/use of the development, any water connection utilised for construction/the development must have a backflow prevention device and water meter installed, to the satisfaction of TasWater.

FINAL PLANS, EASEMENTS & ENDORSEMENTS

4. Prior to the Sealing of the Final Plan of Survey, a Consent to Register a Legal Document must be obtained from TasWater as evidence of compliance with these conditions when application for sealing is made.
   Advice: Council will refer the Final Plan of Survey to TasWater requesting Consent to Register a Legal Document be issued directly to them on behalf of the applicant.

5. Pipeline easements, to TasWater's satisfaction, must be created over any existing or proposed TasWater infrastructure and be in accordance with TasWater's standard pipeline easement conditions.

6. Prior to the issue of a TasWater Consent to Register a Legal Document, the applicant must submit a

.dwg file, prepared by a suitably qualified person to TasWater's satisfaction, showing:

a. the exact location of the existing sewerage infrastructure,

b. the easement protecting that infrastructure.

The developer must locate the existing TasWater infrastructure and clearly show it on the .dwg file. Existing TasWater infrastructure may be located by a surveyor and/or a private contractor engaged at the developers cost.

DEVELOPMENT ASSESSMENT FEES

7. The applicant or landowner as the case may be, must pay a development assessment fee of $211.63, and a Consent to Register a Legal Document fee of $149.20 to TasWater, as approved by the Economic Regulator and the fees will be indexed, until the date paid to TasWater.

The payment is required within 30 days of the issue of an invoice by TasWater.

Advice

General

For information on TasWater development standards, please visit http://www.taswater.com.au/Development/Development-Standards

For application forms please visit http://www.taswater.com.au/Development/Forms

Service Locations

Please note that the developer is responsible for arranging to locate the existing TasWater infrastructure and clearly showing it on the drawings. Existing TasWater infrastructure may be located by a surveyor and/or a private contractor engaged at the developers cost to locate the infrastructure.
The location of this infrastructure as shown on the GIS is indicative only.

(a) A permit is required to work within TasWater's easements or in the vicinity of its infrastructure. Further information can be obtained from TasWater

(b) TasWater has listed a number of service providers who can provide asset detection and location services should you require it. Visit www.taswater.com.au/Development/Service-location for a list of companies

(c) TasWater will locate residential water stop taps free of charge

(d) Sewer drainage plans or Inspection Openings (IO) for residential properties are available from your local council.

Declaration

The drawings/documents and conditions stated above constitute TasWater's Submission to Planning Authority Notice.

Authorised by

Jason Taylor
Development Assessment Manager

TasWater Contact Details			
Phone	13 6992	Email	development@taswater.com.au
Mail	GPO Box 1393 Hobart TAS 7001	Web	www.taswater.com.au

REFERRAL OF DEVELOPMENT APPLICATION PLN-21-0020 TO WORKS & INFRASTRUCTURE DEPARTMENT

Property/Subdivision No: 109000.39
Date: 12 March 2021
Applicant: Mr Carlton Dixon
Proposal: Visitor Accommodation, 2 lot subdivision, demolish shed (Potentially Contaminated Land Code)
Location: 77-79 Main Street, Cressy

W&I referral PLN-21-0020, 77-79 Main Street, Cressy

Planning admin: W&I fees paid.

Jonathan - if you require further information, advise planning section as soon as possible – there are only 14 days from receipt of permitted applications and 21 days from receipt of discretionary applications to stop the clock.

Please inspect the property and advise regarding stormwater/drainage, access, traffic, and any other engineering concerns.

Is there is a house on one of the lots?	*Yes*
Is it connected to all Council services?	*No, shed not connected to stormwater*
Are any changes / works required to the house lot?	*No*
Are the discharge points for stormwater, infrastructure that is maintained by Council? (This requires a check to ensure the downstream infrastructure is entirely owned, maintained, operated by Council and have been taken over as Council assets.)	*Yes*

Stormwater:

Does the physical location of stormwater services match the location shown on the plan? (Requires an on-site inspection)	*Yes*
Is the property connected to Council's stormwater services?	*Yes*
If so, where is the current connection/s?	*Connects to kerb*
Can all lots access stormwater services?	*Yes*
If so, are any works required?	*No*
Is stormwater detention required	*No*
Has a stormwater detention design been submitted	*No*
If so, is it designed for 20- year ARI with overland flow path to road or any other low risk Council approved place of discharge.	*N/A*
If no to above , has the design for 100 – year ARI been done.	*N/A*
If yes to any of the above, does it comply with Councils stormwater policy	*N/A*
Is the design approved by works & infrastructure	*N/A*
Please quote drawing numbers and any other relate documentation (email etc.)	*#:*
Additional Comments/information	*No*
Stormwater works required:	
Works to be in accordance with Standard Drawing TSD-SW25 – a 100mm stormwater connection.	

Is there kerb and gutter at the front of the property?	*Yes*
Are any kerb-and-gutter works required?	*No*

Road Access:

Does the property have access to a made road?	*Yes*
If so, is the existing access suitable?	*Yes*
Does the new lot/s have access to a made road?	*Yes*
If so, are any works required?	*No*
Is off-street parking available/provided?	*Yes*
Road / access works required:	
N/A	
Is an application for vehicular crossing form required?	*No*
Is a footpath required?	*No*
Extra information required regarding driveway approach and departure angles	*No*
Are any road works required?	*No*
Are street trees required?	*No*
Additional Comments:	An Engineer's design **is not** required.

Engineer's comment:

WORKS & INFRASTRUCTURE DEPARTMENT CONDITIONS

STANDARD CONDITIONS FOR SMALL SUBDIVISIONS

W.1 Stormwater

Each lot must be provided with a connection to the Council's stormwater system, constructed in accordance with Council standards and to the satisfaction of Council's Works & Infrastructure Department.

All existing buildings must be plumbed into the Council stormwater system to the satisfactions of Council's plumbing inspector.

W.2 Access (Urban)

An access must be provided to each lot in accordance with Council standards.

W.5 Works in State road reserve

a) The developer must obtain a permit from the Department State Growth for any works to be undertaken within the State Road reservation, including any works necessary in relation to access construction, stormwater drainage and/or traffic management control and devices from the proposal.

b) Application requirements and forms can be found at transport.tas.gov.au/road/permits, applications must be submitted at least twenty-eight (28) days prior to any scheduled works. In accordance with the Roads and Jetties Act 1935, works must not be commenced within the State Road reservation until a permit has been issued.

W.6 Separation of stormwater services

a) All existing stormwater pipes and connections must be located.

b) Where required, pipes are to be rerouted to provide an independent system for each lot.

c) Certification must be provided that stormwater services have been separated between the lots.

W.8 Pollutants

a) The developer/property owner must ensure that pollutants such as mud, silt or chemicals are not released from the site.

b) Prior to the commencement of the development authorised by this permit the developer/property owner must install all necessary silt fences and cut-off drains to prevent soil, gravel and other debris from escaping the site. Material or debris must not be transported onto the road reserve (including the nature strip, footpath and road pavement). Any material that is deposited on the road reserve must be removed by the developer/property owner. Should Council be required to clean or carry out works on any of their infrastructure as a result of pollutants being released from the site the cost of these works may be charged to the developer/property owner.

Jonathan Galbraith (Engineering Officer)
Accesses discussed with Leigh McCullagh (Works Manager)
Date: 26/3/21

Karen Jenkins

From: Quinn Concrete & Civil <
Sent: Wednesday, 24 March 2021 10:55 AM
To: NMC Planning
Subject: Planning Application PLN-21-0020

Follow Up Flag: Follow up
Flag Status: Completed

We have read through the planning application PLN-21-0020 and have no objections to the proposed development. The only stipulation we have is for the rumpus room to be noise proofed, as our property is close and we would not appreciate noise coming from this building late into the night.

Shane Quinn & Mary-Ann Schouten
75 Main Street Cressy

Paul Godier

From: NMC Planning
Sent: Monday, 19 April 2021 11:58 AM
To: Paul Godier
Subject: FW: Planning Application PLN-21-0020

Rosemary Jones

Administration Officer - Community & Development | Northern Midlands Council
Council Office, 13 Smith Street (PO Box 156), Longford Tasmania 7301
T: (03) 6397 7303 | F: (03) 6397 7331
E: rosemary.jones@nmc.tas.gov.au | W: www.northernmidlands.tas.gov.au

NORTHERN MIDLANDS COUNCIL

Tasmania's Historic Heart

employer of choice

From: Quinn Concrete & Civil
Sent: Monday, 19 April 2021 10:47 AM
To: NMC Planning <planning@nmc.tas.gov.au>
Subject: RE: Planning Application PLN-21-0020

Thank you for following up on our comments. I have researched the noise levels you specify, with 40dB being on louder than the normal spoken voice. We have no opposition to the application with the noise levels of 50dB & 40dB being adhered to.

Regards

Shane Quinn & Mary-Ann Schouten

From: NMC Planning [mailto:planning@nmc.tas.gov.au]
Sent: Tuesday, 13 April 2021 11:16 AM
To: Quinn Concrete & Civil
Subject: RE: Planning Application PLN-21-0020

Thank you for your email.

Can you please advise if the following condition is placed on the permit, would it address your concerns.

The rumpus room must be noise proofed so that:

Noise levels at the boundary of the site with any adjoining land do not exceed:

a) 50dB(A) day time; and

b) 40dB(A) night time; and

Noise levels in habitable rooms of nearby sensitive uses do not exceed 5dB(A) above background

Regards,

Paul Godier

Senior Planner | Northern Midlands Council
Council Office, 13 Smith Street (PO Box 156), Longford Tasmania 7301
T: (03) 6397 7303 | F: (03) 6397 7331
E: paul.godier@nmc.tas.gov.au | W: www.northernmidlands.tas.gov.au
Tasmania's Historic Heart

From: Quinn Concrete & Civil <quinn.concreteandcivil@bigpond.com>
Sent: Wednesday, 24 March 2021 10:55 AM
To: NMC Planning <planning@nmc.tas.gov.au>
Subject: Planning Application PLN-21-0020

We have read through the planning application PLN-21-0020 and have no objections to the proposed development. The only stipulation we have is for the rumpus room to be noise proofed, as our property is close and we would not appreciate noise coming from this building late into the night.

Shane Quinn & Mary-Ann Schouten
75 Main Street Cressy