

## 2. Development Constraints

### 2.1 Easements

#### 2.1.1 Sewer & Electrical

An existing shared service easement of varying width between 2.5m and 4m is aligned adjacent to the northern boundary and contains an underground electricity and sewer service. The existing sewer and electrical easement may be a constraint to the development of the block.

#### 2.1.2 Gas

The gas main is currently identified on ACTMAPi to be located within an existing easement with an approximate width of 3.7m. The existing gas easement may be a constraint to the development of the block.

### 2.2 Overland Flow

There appears to be an existing minor overland flow path through the Site that could convey flow from a low point in the carpark towards the oval to the east. The indicative alignment of this overland flow path is shown on the Existing Services Plan, drawing number MMD-311006-C-DR-CC05-SP-0001 in Appendix A.

This overland flow path has a potential catchment area of approximately 12 Ha. The overland flow path has been identified on the basis of a visual assessment on site and contour information of the surrounding area shown on ACTMAPi.

To comply with the Design Standards for Urban Infrastructure the overland flow paths should not cross block leases. The overland flow path may be a development constraint to the Site. A site survey is required to be undertaken to confirm the overland flow path alignment.



### 2.3 Existing Path

There is an existing concrete footpath that passes through the southern part of the Site that currently provides access from Rivett shops to the path network within the open space system as well as nearby playground facilities. Refer Figure 2.1 below.

Figure 2.1: Existing footpath through the Site



It is proposed that the existing footpath through the Site be removed and offsite pedestrian facilities be upgraded by providing footpath continuity to the existing carpark servicing the oval. It is anticipated that the existing footpath south of the development Site should be sufficient for the pedestrians accessing the path network and the playground from the Rivett shops.

Preliminary discussions with TAMS have indicated that further investigation beyond the scope of this report, including observations of pedestrian movements and volumes is required to be carried out to identify the impact of removing the pedestrian footpath. – Refer correspondence in Appendix C.



**2.4 Tree Assessment**

A Tree Assessment dated 17/06/2013 undertaken by Envirolinks Design (reference number 1317), refer to Appendix D, indicates the following:

- There are approximately 35 trees located within the Site – Refer figures 2.2 and 2.3 showing existing trees;

Figure 2.2: Existing Site Trees





Figure 2.3: Existing Site Trees



- 1 high value protected tree is located within the adjacent verge of Rivett Place towards the south west corner of the block;
- Generally the majority of trees within the block are of low value, with the exception of 2 medium value trees; and
- Two trees within the Site towards the south east corner are considered to be Protected Trees under the Tree Protection Act 2005.

Trees identified as protected may be a constraint to the development of the block.



### 3. Cost Estimate

The cost estimate to provide site servicing to the Site is as follows:

ITEM	DETAILS	COST
Stormwater	Stormwater tie to new maintenance hole adjacent to western boundary of the Site	
Sewer	Utilise existing tie subject to a capacity and condition check.	
Water Supply	Water supply tie to existing main on eastern boundary of the Site	
Telecommunication, Gas and Electricity	Ultimate connection by leaseholder (potential relocation of telecommunication pit and gas connection not included)	
Vergeworks	Demolition of existing footpath through Site Extension of existing footpath along the western boundary of the Site Restoration grassing in vicinity of path Hard paving	
Access	Provision for vehicular access	
TOTAL		

pl within site

The above indicative cost estimates are allowances only. Further design development may amend the design and associated cost estimates. This indicative cost estimate is qualified on that basis. The above costs include

- 10% GST;
- 10% to account for preliminaries;
- 20% allowance for construction contingencies; and
- 20% allowance has been included in the estimates to account for design and supervision.

It is understood to be service authority policy that gas, electricity and communications will be supplied to the block boundary at the authorities' expense subject to the commercial viability of the ultimate demand. However, it is possible that these network connections may incur some cost to the leaseholder. These potential costs do not form part of the above indicative estimate.





# Appendices

Appendix A. Site Plans	17
Appendix B. Dial Before You Dig Plans	18
Appendix C. Authority Correspondence	19
Appendix D. Tree Assessment	20
Appendix E. Contamination/Geotechnical Reports	21





# Appendix A. Site Plans

- A.1. Existing Services Plan**
- A.2. Proposed Services Plan**





- EXISTING SERVICES**
- S ○ SEWER, MAINTENANCE HOLE
  - SW ○ STORMWATER, SUMP, MAINTENANCE HOLE
  - W ○ WATER, STOP VALVE, HYDRANT
  - G ○ GAS
  - E ○ ELECTRICITY (UNDERGROUND)
  - A ○ ELECTRICITY (OVERHEAD)
  - SL ○ STREET LIGHTING
  - T ○ TELSTRA
  - TR ○ TRANSACT
- EXISTING FEATURES**
- 610 ○ 1.0m CONTOUR (ACTMAP1 12/07/2013)
  - MINOR OVERLAND FLOW PATH (TBC WITH SURVEY)
  - BOUNDARY BLOCK 13
  - SERVICE EASEMENT
  - FOOTPATH

**NOTE:**  
EXISTING SERVICES HAVE BEEN COMPILED FROM SUPPLIED DATA. THE PRINCIPAL DOES NOT GUARANTEE THE ACCURACY OF THIS INFORMATION.

P2	-	NC	PRELIMINARY	MB	MB
P1	26.06.2013	NC	PRELIMINARY	MB	MB
Rev	Date	Drawn	Description	MB	App'd

**Mott MacDonald**

Units 11 and 12, First Floor  
28-30 Traragan Court  
Brisbane, QLD 4007  
Australia  
T +61 (0)2 8253 1655  
F +61 (0)2 8253 1666  
www.mottmac.com.au

Client

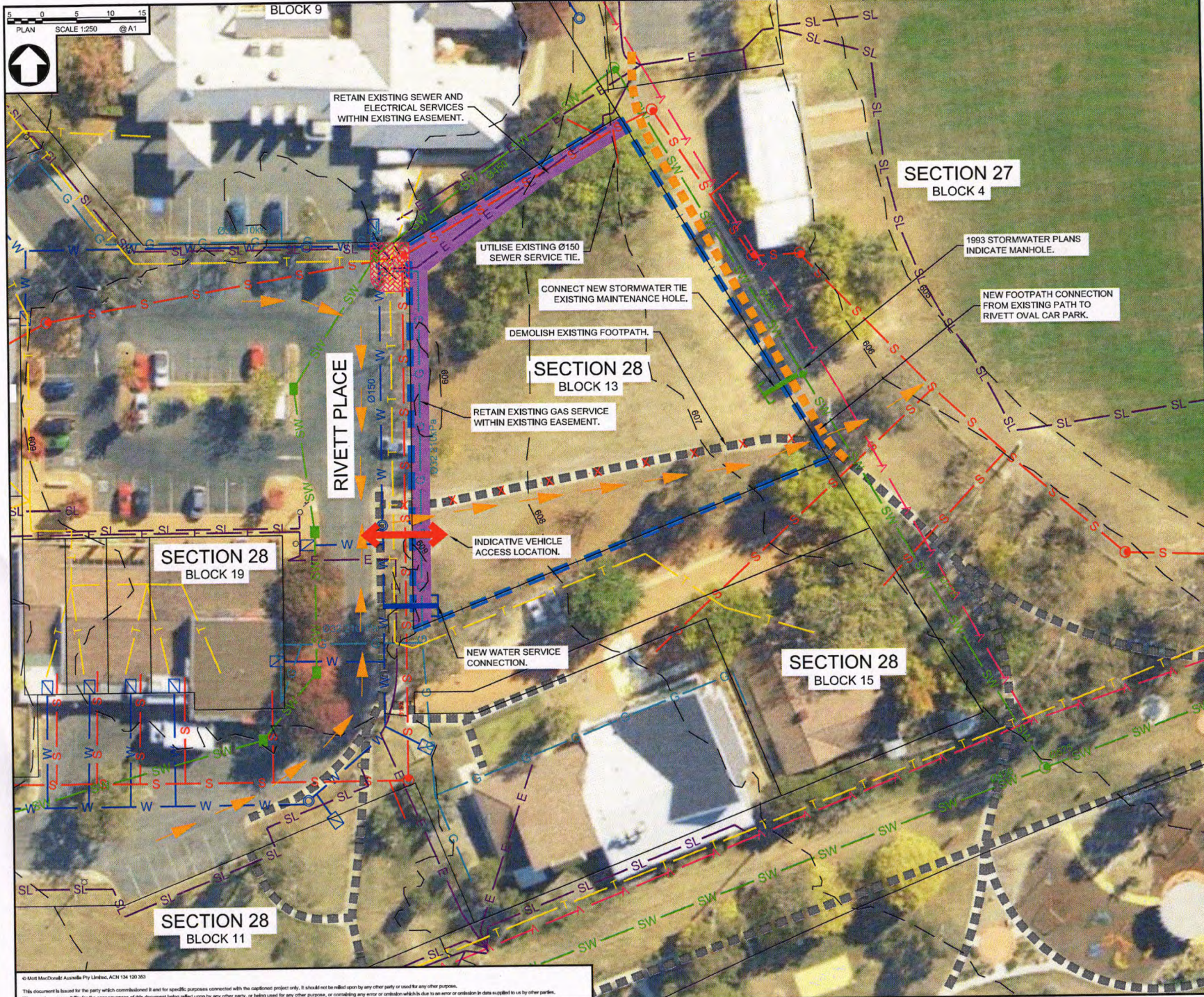
**Land Development Agency**

Title: **EXISTING SERVICES PLAN RIVETT SECTION 28 BLOCK 13**

Designed	N.Cortese	Eng check	M.Breen
Drawn	N.Cortese	Coordination	M.Breen
Dwg check	M.Breen	Approved	M.Breen
Scale at A1	1:250	Status	PRE
Drawing Number	MMD-311006-C-DR-CC05-SP-0001	Rev	P2

© Mott MacDonald Australia Pty Limited, ACN 120 303  
This document is issued for the party which commissioned it and for specific purposes connected with the captioned project only. It should not be relied upon by any other party or used for any other purpose.  
We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.  
C:\Users\Project1\Documents\311006\C-0506 CADW\_4 Working drawings\CAD\AutoCAD\Drawings\MMD-311006-C-DR-CC05-SP-0001.dwg 21/2/2013 - 4:41PM user1428





**EXISTING SERVICES**

- S Sewer, Maintenance Hole
- SW Stormwater, Sump, Maintenance Hole
- W Water, Stop Valve, Hydrant
- G Gas
- E Electricity (Underground)
- A Electricity (Overhead)
- SL Street Lighting
- T Telstra
- TR Transact

**EXISTING FEATURES**

- 610 1.0m Contour (ACT/MAP1 12/07/2013)
- Minor Overland Flow Path (TBC With Survey)
- Boundary Block 13
- Service Easement
- Footpath

**PROPOSED FEATURES**

- Indicative Vehicle Access Location
- Footpath
- Demolish Existing Footpath
- Verge Paving
- Stormwater Tie
- Water Service Connection

**NOTE:**  
EXISTING SERVICES HAVE BEEN COMPILED FROM SUPPLIED DATA. THE PRINCIPAL DOES NOT GUARANTEE THE ACCURACY OF THIS INFORMATION.

P1	22.07.2013	NC	PRELIMINARY	MB	MB
Rev	Date	Drawn	Description	Ch'gd	App'd

Units 11 and 12, 5th Floor  
Block C, Tower Plenary House  
26-30 Trarigon Court  
Brisbane, ACT 2617  
Australia  
T +61 (0)2 6263 1565  
F +61 (0)2 6263 1666  
www.mottmac.com.au

Client

Land Development Agency

Title  
**PROPOSED SERVICES PLAN  
RIVETT SECTION 28 BLOCK 13**

Designed	N. Cortese	Eng check	M. Breen
Drawn	N. Cortese	Coordination	M. Breen
Dwg check	M. Breen	Approved	M. Breen
Scale at A1	1:250	Status	PRE
Scale at A1	1:250	Status	PRE
Scale at A1	1:250	Status	P1

Drawing Number  
**MMD-311006-C-DR-CC05-SP-0002**

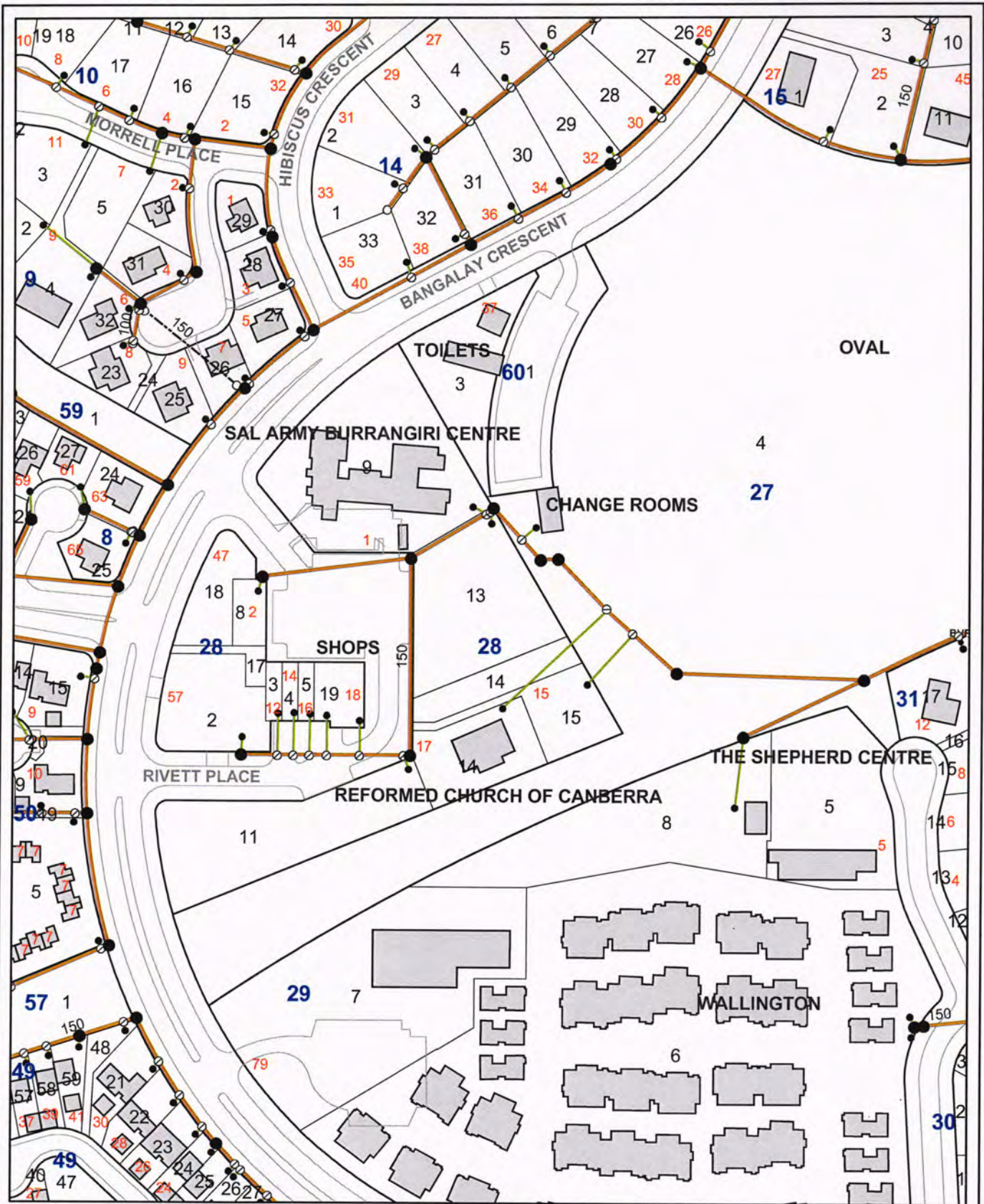
© Mott MacDonald Australia Pty Limited, ACN 134 120 303  
This document is issued for the party which commissioned it and for specific purposes connected with the captioned project only. It should not be relied upon by any other party or used for any other purpose.  
We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.  
F:\C:\barbara\Projects\311006\CC0506 CAD\A\_ Working drawings\CM\Amical Drawing\MMD-311006-C-DR-CC05-SP-0002.dwg 25/07/2013 4:32PM 85687



## Appendix B. Dial Before You Dig Plans

- B.1. ActewAGL Sewer Plan**
- B.2. ActewAGL Electricity Plan**
- B.3. ActewAGL Water Supply Plan**
- B.4. ActewAGL Gas Plan**
- B.5. Telstra Telecommunication Plan**





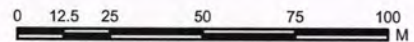
All network distribution data is the property of ActewAGL and no warranty as to the accuracy or completeness of the information is provided. No liability for any loss or damage arising from the use of this information will be accepted.  
Copyright (c) ActewAGL 2003

**ActewAGL Sewer Network**

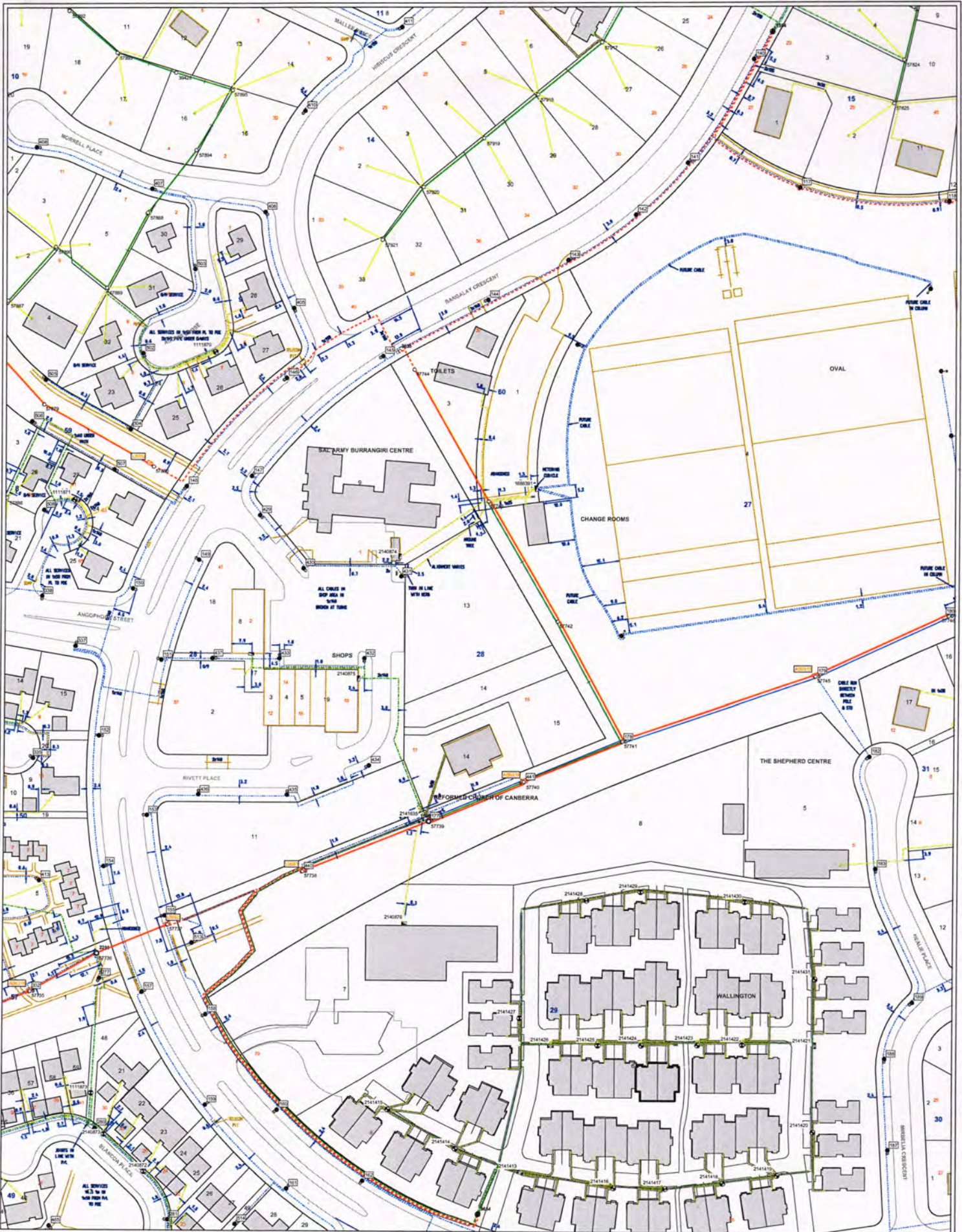


Seq #: 29237175  
Rivett PI, Weston Creek

ACT cadastral information provided by ACT Land Information Centre (ACTLIC), data should only be reproduced with ACTLIC permission  
Copyright (c) ACTLIC 2003







All network distribution data is the property of ActewAGL and no warranty as to the accuracy or completeness of the information is provided. No liability for any loss or damage arising from the use of this information will be accepted.  
Copyright (c) ActewAGL 2003

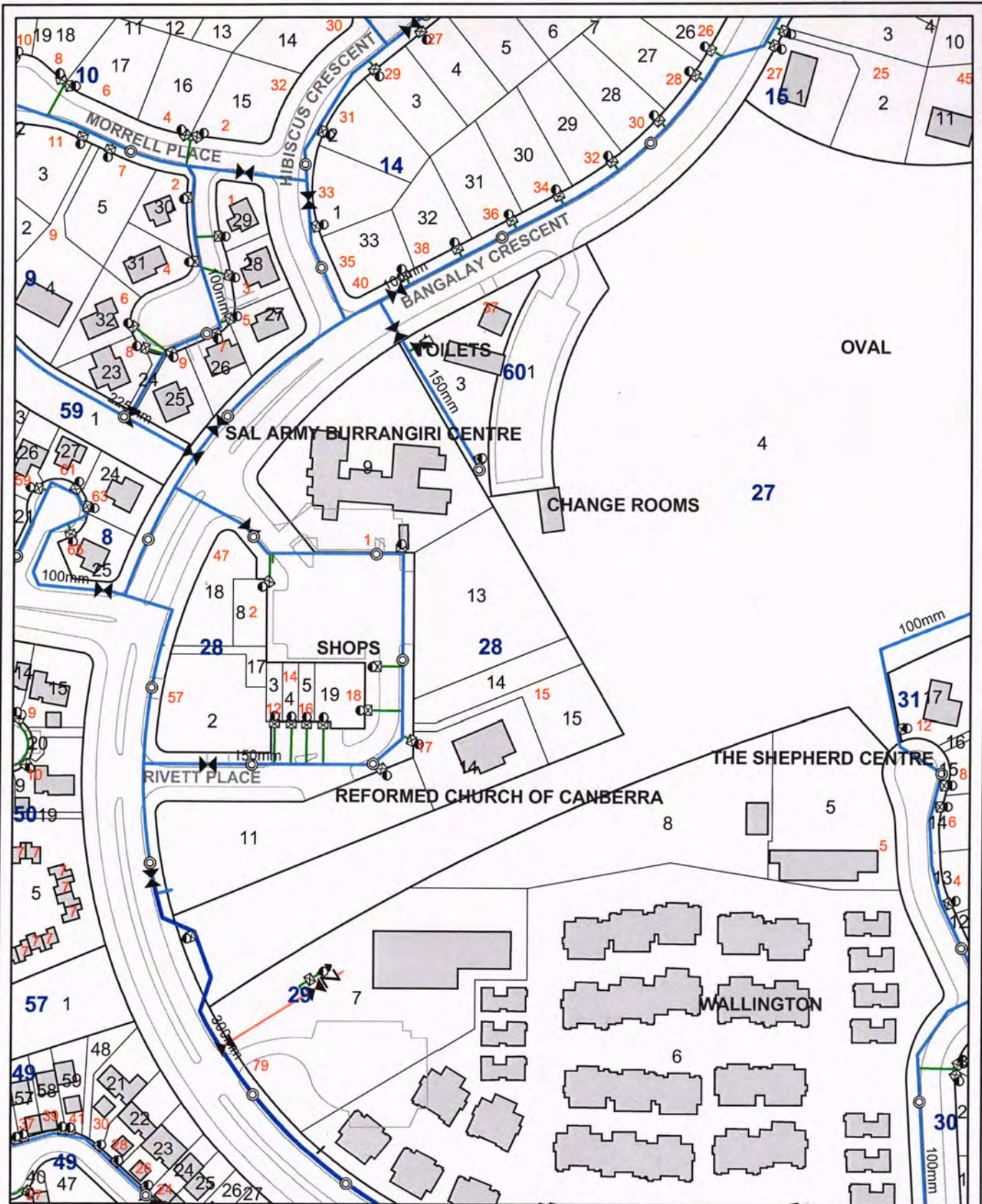
**ActewAGL Electricity Network**

Doc # 20237175  
Herald Pt, Winton, Queensland

ACT cadastral information provided by ACT Land Information Centre (ACTLIC), data should only be reproduced with ACTLIC permission.  
Copyright (c) ACTLIC 2003







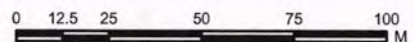
All network distribution data is the property of ActewAGL and no warranty as to the accuracy or completeness of the information is provided. No liability for any loss or damage arising from the use of this information will be accepted. Copyright (c) ActewAGL 2003

**ActewAGL Water Network**

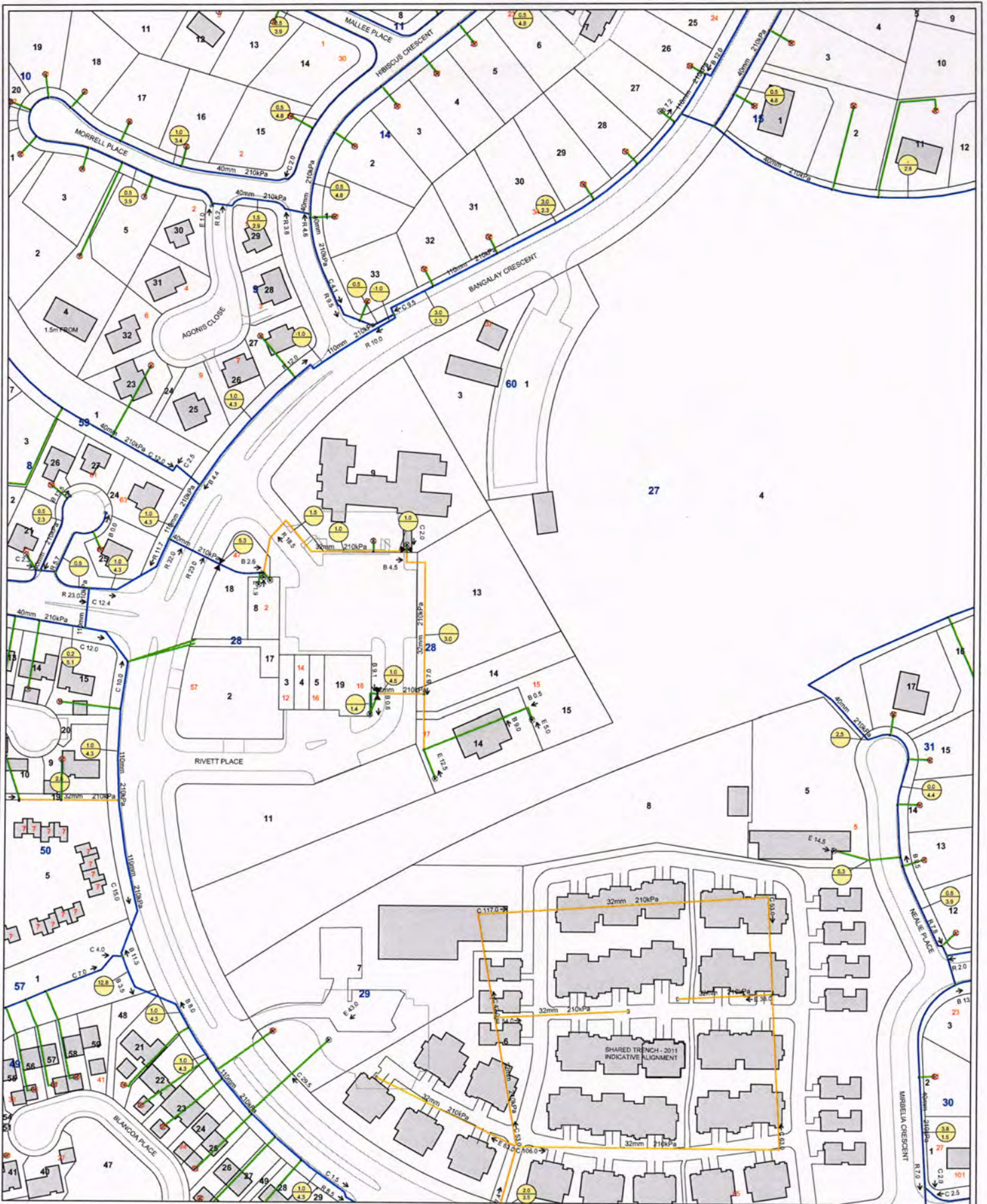
**ActewAGL**

Seq #: 29237175  
Rivett Pl, Weston Creek

ACT cadastral information provided by ACT Land Information Centre (ACTLIC), data should only be reproduced with ACTLIC permission. Copyright (c) ACTLIC 2003







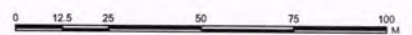
**ActewAGL Gas Network**

All network distribution data is the property of ActewAGL and no warranty as to the accuracy or completeness of the information is provided. No liability for any loss or damage arising from the use of this information will be accepted.  
Copyright (c) ActewAGL 2003

Seq #: 29237175  
Rivett Pl, Weston Creek



ACT cadastral information provided by ACT Land Information Centre (ACTLIC), data should only be reproduced with ACTLIC permission  
Copyright (c) ACTLIC 2003





# Cable Plan



For all Telstra DBYD plan enquiries -  
 email - Telstra.Plans@team.telstra.com  
 For urgent onsite contact only - ph 1800 653 935 (bus hrs)

Sequence Number: 29237174  
 Please read Duty of Care prior to any excavating

TELSTRA CORPORATION LIMITED A.C.N. 051 775 556

Generated On 29/05/2013 10:47:15

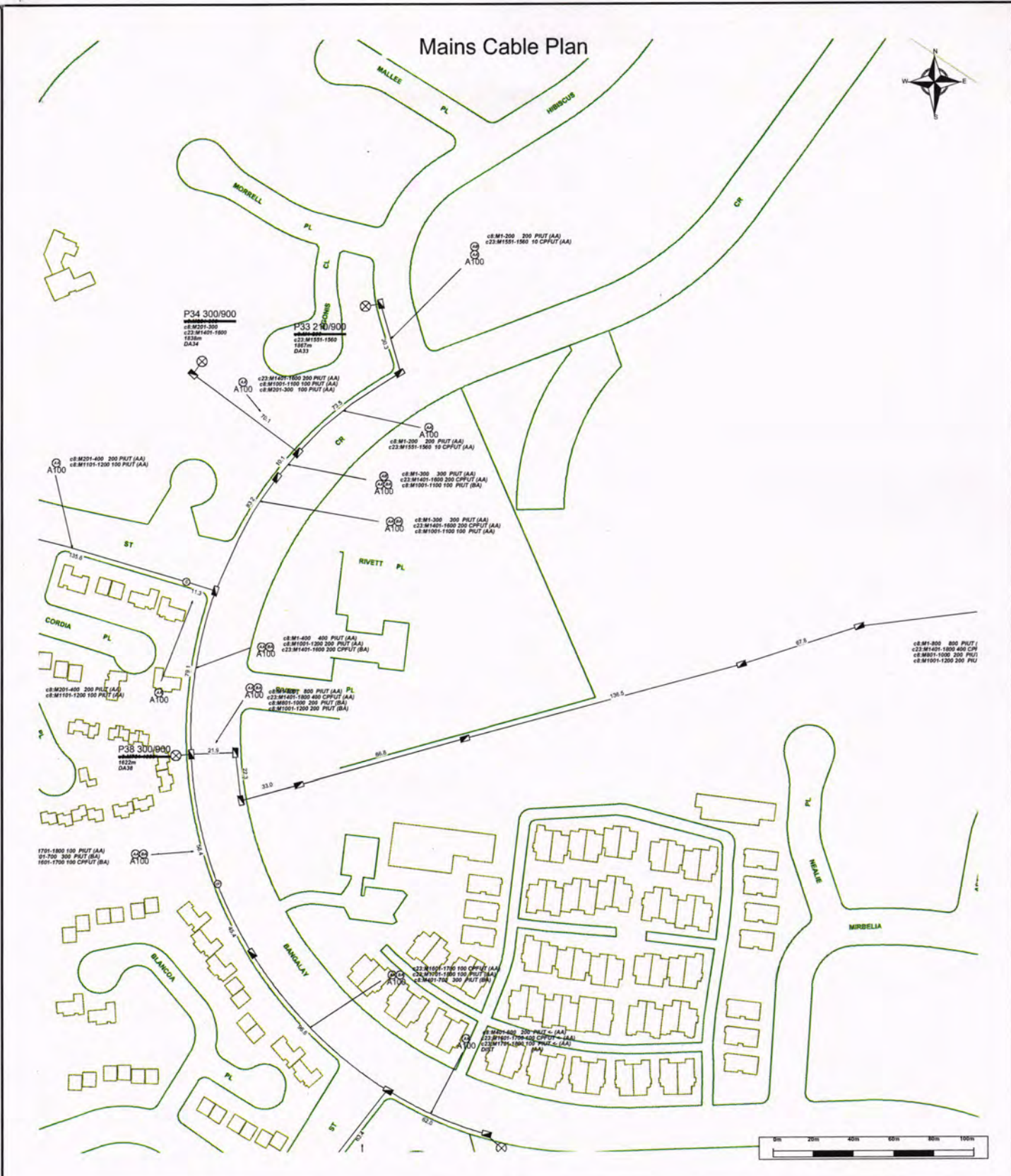
The above plan must be viewed in conjunction with the Mains Cable Plan on the following page

**WARNING** - Due to the nature of Telstra underground plant and the age of some cables and records, it is impossible to ascertain the precise location of all Telstra plant from Telstra's plans. The accuracy and/or completeness of the information supplied can not be guaranteed as property boundaries, depths and other natural landscape features may change over time, and accordingly the plans are indicative only. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans.

It is your responsibility to locate Telstra's underground plant by careful hand pot-holing prior to any excavation in the vicinity and to exercise due care during that excavation.  
 Please read and understand the information supplied in the duty of care statement attached with the Telstra plans. TELSTRA WILL SEEK COMPENSATION FOR LOSS CAUSED BY DAMAGE TO ITS PLANT.  
 Telstra plans and information supplied are valid for 60 days from the date of issue. If this timeframe has elapsed, please reapply for plans.



# Mains Cable Plan



**Telstra**

For all Telstra DBYD plan enquiries -  
 email - [Telstra.Plans@team.telstra.com](mailto:Telstra.Plans@team.telstra.com)  
 For urgent onsite contact only - ph 1800 653 935 (bus hrs)

**TELSTRA CORPORATION LIMITED A.C.N. 051 775 556**

Generated On 29/05/2013 10:47:19

Sequence Number: 29237174

Please read Duty of Care prior to any excavating

**WARNING -** Due to the nature of Telstra underground plant and the age of some cables and records, it is impossible to ascertain the precise location of all Telstra plant from Telstra's plans. The accuracy and/or completeness of the information supplied can not be guaranteed as property boundaries, depths and other natural landscape features may change over time, and accordingly the plans are indicative only. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans.

It is your responsibility to locate Telstra's underground plant by careful hand pot-holing prior to any excavation in the vicinity and to exercise due care during that excavation.

Please read and understand the information supplied in the duty of care statement attached with the Telstra plans. **TELSTRA WILL SEEK COMPENSATION FOR LOSS CAUSED BY DAMAGE TO ITS PLANT.**

Telstra plans and information supplied are valid for 60 days from the date of issue. If this timeframe has elapsed, please reapply for plans.



## Appendix C. Authority Correspondence

- C.1. ACTER Water Sewer & Water Tie Connections**
- C.2. ActewAGL network enquiry**
- C.3. ZNX gas service connection**
- C.4. Telsta communications connection**
- C.5. TAMS Access, footpath and Stormwater Connections**



**Filardo, Michael D**

---

**From:** Reid, Bruce  
**Sent:** 05 July 2013 15:44  
**To:**  
**Subject:** RE: Water Network Query - Rivett Section 28 Block 13

/ Michael

**Rivett Section 28 Block 13**

The location of the new water supply connection and existing sewer tie appear to be in acceptable locations. Water service location and size maybe adjusted to suit the proposed development, otherwise a nominal diameter service be supplied.

Regards

**Bruce Reid**  
**Senior Technical Officer**  
**ACTEW Water**  
 12 Hoskins St Mitchell, ACT 2911  
 Ph; 2  
 Email;

---

**From:**  
**Sent:** Tuesday, 25 June 2013 16:02  
**To:** Reid, Bruce  
**Cc:** Breen, Mike J  
**Subject:** RE: Water Network Query - Rivett Section 28 Block 13

Hi Bruce,

Further to my email below, please refer to the attached sketch showing the:

- proposed location for a new water service tie to the west boundary of Block 13, connecting to an existing water main on Rivett Place; and
- location of an existing 150mm dia sewer tie at the north corner of Block 13, to be utilised.

Could you please review the sketch and provide in-principle approval for these service ties?

Kind Regards,

- Civil Design Drafter

**Mott MacDonald** T: +61(0)2 6253 1555 F: +61(0) 6253 1666 Email: [nic.cortese@mottmac.com.au](mailto:nic.cortese@mottmac.com.au)  
 First Floor, block C, Trevor Percy House, 28-30 Traeger Court, Bruce ACT 2617

---

**From:**  
**Sent:** 24 June 2013 3:43 PM  
**To:** Bruce Reid  
**Cc:** Breen, Mike J  
**Subject:** Water Network Query - Rivett Section 28 Block 13



Hi Bruce,

Mott MacDonald is undertaking a Site Investigation Report on behalf of the LDA for the aforementioned block. As part of this investigation we are required to identify ActewWater networks that can provide a water connection for a future development. According to the plans provided via Dial Before You Dig there are ActewWater water main parallel to the western of Block 13 within the road reserve of Rivett Place (please see attached).

Could you please advise of a suitable location to provide a service connection to the site?

Please do not hesitate to contact me should you require anything further.

Kind Regards,

*Civil Design Drafter*

**Mott MacDonald**

Units 11 & 12, First Floor, Block C, Trevor Pearcey House,  
28-30 Traeger Court, Bruce ACT 2617 Australia  
[www.mottmac.com](http://www.mottmac.com)

T +61 (0)2 6253 1555 | F +61 (0)2 6253 1666  
E

**Mott MacDonald - Confidential Communication.** This e-mail is confidential. If you are not the intended recipient, or you have received this e-mail in error, any use, dissemination, or copying is prohibited. Please destroy this transmission (including any attachments), and notify the sender by reply e-mail. Mott MacDonald takes care to ensure that data transmitted is appropriate and that the content is free from viruses or defects. However, we do not warrant that this communication is free from any viruses or defects. We deny any liability for loss or damage caused as a result of the receipt or use of this communication.

\*\*\*\*\*  
\*PLEASE NOTE\* This email and any attachments may be confidential. If received in error, please delete all copies and advise the sender. The reproduction or dissemination of this email or its attachments is prohibited without the consent of the sender.

WARNING RE VIRUSES: Our computer systems sweep outgoing email to guard against viruses, but no warranty is given that this email or its attachments are virus free. Before opening or using attachments, please check for viruses. Our liability is limited to the re-supply of any affected attachments.

Any views expressed in this message are those of the individual sender, except where the sender expressly, and with authority, states them to be the views of the organisation.  
\*\*\*\*\*



**Filardo, Michael D**

---

**From:** enworks <enworks@actewagl.com.au>  
**Sent:** 28 June 2013 14:35  
**To:** enworks  
**Cc:** Breen, Mike J  
**Subject:** RE: Electricity Network Query - Rivett Section 28 Block 13

Hi

The service that exist within the easement of the block 13 is to be retained and if developer requires to relocate this service then they need to provide us the route. There is another enquiry going on for the relocation of this service, you need to contact me so that I can discuss further as what is required and how this can be done.

Moreover in regards to the current capacity of the network, we need to know type and size of the development for block 13 before we can tell you how this will be service. It would be better if you submit the PNA request in future when you have further details available for the development.

Please feel free to contact me for further clarification.

Thank you.

**Kind Regards**  
**Nadeem Azizi**

Senior Network Connections Engineer  
 ActewAGL

T: 02 6293 5714 | F: 02 6293 5851 | M:

[www.actewagl.com.au](http://www.actewagl.com.au)

Please consider our environment before printing this email.

---

**From:**  
**Sent:** Friday, 28 June 2013 10:29 AM  
**To:** enworks  
**Cc:** Breen, Mike J  
**Subject:** Electricity Network Query - Rivett Section 28 Block 13

Hi,

Mott MacDonald are currently undertaking a Site Investigation Report on behalf of the LDA for the aforementioned block. As part of this investigation we are required to identify electrical services that may limit development of the site and also those that can provide a potential connection for a future development. ActewAGL Dial Before You Dig plans indicate that there is an electrical service line located within the north boundary of Block 13 (please refer attached). It is understood that this main is located within an established easement as indicated on ACTMAPi.

Could ActewAGL please advise if:

- it is preferred that the service that exists with the easement of Block 13 be retained and not relocated; and
- there is capacity within the current network to provide electrical services to a development on Block 13?

Please do not hesitate to contact me should you require anything further.



Kind Regards,

*Civil Design Drafter*

**Mott MacDonald**

Units 11 & 12, First Floor, Block C, Trevor Pearcey House,  
28-30 Traeger Court, Bruce ACT 2617 Australia  
[www.mottmac.com](http://www.mottmac.com)

T +61 (0)2 6253 1555 | F +61 (0)2 6253 1666  
E

**Mott MacDonald - Confidential Communication.** This e-mail is confidential. If you are not the intended recipient, or you have received this e-mail in error, any use, dissemination, or copying is prohibited. Please destroy this transmission (including any attachments), and notify the sender by reply e-mail. Mott MacDonald takes care to ensure that data transmitted is appropriate and that the content is free from viruses or defects. However, we do not warrant that this communication is free from any viruses or defects. We deny any liability for loss or damage caused as a result of the receipt or use of this communication.

---

\*\*\*\*\*  
\*PLEASE NOTE\* This email and any attachments may be confidential. If received in error, please delete all copies and advise the sender. The reproduction or dissemination of this email or its attachments is prohibited without the consent of the sender.

WARNING RE VIRUSES: Our computer systems sweep outgoing email to guard against viruses, but no warranty is given that this email or its attachments are virus free. Before opening or using attachments, please check for viruses. Our liability is limited to the re-supply of any affected attachments.

Any views expressed in this message are those of the individual sender, except where the sender expressly, and with authority, states them to be the views of the organisation.  
\*\*\*\*\*



---

**From:**  
**Sent:** 25 June 2013 09:11  
**To:**  
**Cc:** Breen, Mike J  
**Subject:** RE: Gas Network Query - Rivett Section 28 Block 13

G'day Nik,

In response to your queries:

1. If you leave the gas main in its current location, then the block usage is limited.
2. We might need to bore under the car park to move the main outside the property.
3. No issues with servicing from anywhere along the main.

I had a look at Catnap, and can see the frontage nominated (coloured) as a 'gas easement'. Is it tho? I can't remember asking for one? What does the Deposited Plan (amended?) show? If this is a *registered* easement, then I recommend leaving the main 'as is' and advise the developer that he is restricted in building right to the boundary line. If there is not a registered easement on this block, then ZNX will relocate the main from the property at the developer's cost.

Regards

Construction Project Planner

Ph  
 E:



5-7 Johns Place  
 HUME ACT 2620

***ZNX is part of the Zinfra Group, previously known as Jemena Infrastructure Services, and was launched as a specialist infrastructure service provider on 1<sup>st</sup> April 2012.***

---

**From:**  
**Sent:** Monday, 24 June 2013 12:18 PM  
**To:**  
**Cc:** Breen, Mike J  
**Subject:** Gas Network Query - Rivett Section 28 Block 13

Hi

Mott MacDonald are currently undertaking a Site Investigation Report on behalf of the LDA for the aforementioned block. As part of this investigation we are required to identify gas mains that may limit development of the site and can provide a potential connection for a future development. ActewAGL Dial Before You Dig plans indicate that there is a 210 kPa main 32mm in diameter is located parallel to the western boundary of Block 13 (please refer attached). It is understood that this main is located within an established easement as indicated on ACTMAPi.

Could ZNX please provide the following preliminary advice:

- any limitations on and future development of Block 13 by retaining the gas main in the current easement;
- a suitable route to relocate the gas main outside of the block if this is seen as a viable option;
- whether a connection would be allowed off this line (or any relocation), if required?



Please do not hesitate to contact me should you require anything further.

Kind Regards,

*Civil Design Drafter*

**Mott MacDonald**

Units 11 & 12, First Floor, Block C, Trevor Pearcey House,  
28-30 Traeger Court, Bruce ACT 2617 Australia  
[www.mottmac.com](http://www.mottmac.com)

T +61 (0)2 6253 1555 | F +61 (0)2 6253 1666  
E

**Mott MacDonald - Confidential Communication.** This e-mail is confidential. If you are not the intended recipient, or you have received this e-mail in error, any use, dissemination, or copying is prohibited. Please destroy this transmission (including any attachments), and notify the sender by reply e-mail. Mott MacDonald takes care to ensure that data transmitted is appropriate and that the content is free from viruses or defects. However, we do not warrant that this communication is free from any viruses or defects. We deny any liability for loss or damage caused as a result of the receipt or use of this communication.

\*\*\*\*\*

This is a confidential message intended for the named recipient(s) only. The contents herein are privileged to the sender and the use thereof is restricted to the intended purpose. If you have received this e-mail in error, please do not use, disclose, distribute, copy, print or relay on this email. If receipt is in error, please advise the sender by reply email. Thank you.

\*\*\*\*\*



**Filardo, Michael D**

---

**From:**  
**Sent:** 25 June 2013 17:35  
**To:**  
**Cc:** Breen, Mike J  
**Subject:** RE: Telstra Network Query - Rivett Section 28 Block 13

Developer will need to bring the leadin conduits(s) to the property boundary close to the existing pit. Authorise Telstra personnel will connect developer provided conduit to the Telstra network.

Regards,



**Principal Planner - NSW Country South & ACT**

Forecasting & Area Planning NSW and Wideband | Networks & Access Technologies | Telstra Operations  
 P | M | E [Jacob.y.lai@team.telstra.com](mailto:Jacob.y.lai@team.telstra.com) W <http://www.in.telstra.com.au/ism/nswareaplanning/>

This communication may contain confidential or copyright information of Telstra Corporation Limited (ABN 33 051 775 556). If you are not an intended recipient, you must not keep, forward, copy, use, save or rely on this communication, and any such action is unauthorised and prohibited. If you have received this communication in error, please reply to this email to notify the sender of its incorrect delivery, and then delete both it and your reply.

---

**From:**  
**Sent:** Monday, 24 June 2013 12:54 PM  
**To:**  
**Cc:** Breen, Mike J  
**Subject:** Telstra Network Query - Rivett Section 28 Block 13

Hi

Mott MacDonald are undertaking a Site Investigation Report on behalf of the LDA for the aforementioned block. As part of this investigation we are required to identify Telstra Networks that can provide a connection for a future development. Telstra Dial Before You Dig plans indicate there is an existing a Telstra cables parallel to the western and southern boundaries of Block 13 (please refer attached).

Could Telstra please advise if it will be acceptable in principle, to provide a connection from (one of) the existing C type Telstra Pits to the proposed development Site? If this is not acceptable could Telstra please advise of a suitable location to connect a service connection to the site?

Please do not hesitate to contact me should you require anything further.

Kind Regards,

*Civil Design Drafter*

**Mott MacDonald**

Units 11 & 12, First Floor, Block C, Trevor Pearcey House,  
 28-30 Traeger Court, Bruce ACT 2617 Australia  
[www.mottmac.com](http://www.mottmac.com)



**From:**  
**Sent:** 22 July 2013 15:50  
**To:** Jatheendran, Lingam (Lingam.Jatheendran@act.gov.au)  
**Cc:** Breen, Mike J; Lucia Carson (Lucia.Carson@act.gov.au); Grdur, Michael (Michael.Grdur@act.gov.au);  
**Subject:** RE: TaMS Query - Rivett Section 28 Block 13

Hi Lingam,

Thankyou for your response. Mott MacDonald have prepared a proposed services plan (refer attached) for inclusion into the Site Investigation report on the following basis:

1. Stormwater Tie

Mott MacDonald have identified that there is an existing public 525dia stromwater line outside the eastern boundary of the Site within adjacent Section 27 Block 4 – Urban Open Space. This existing stormwater line is located on the low side of the Site. It is considered appropriate for the service tie for Section 28 Block 13 to connect into the existing manhole along this line at the lower eastern corner of the block as shown on the proposed services plan attached.

2. Path Connection

The existing footpath through the Site currently provides access from Rivett shops to the path network within the open space system as well as neaby playground facilities. It is proposed that the existing footpath through the Site be removed and offsite pedestrian facilities be improved by providing footpath continuity to the existing carpark servicing the oval. It is anticipated that the existing footpath south of the development Site could be utilised to access the path network and the playground from the Rivett shops.

3. Vehicle Access

An indicative location for vehicle access has been shown on the proposed service plan. This location is clear of the existing 90 degree parking spaces adjacent to the western boundary of the Site. This proposed driveway location is also clear of the circulation isle of the carpark which serves Rivett shops. Note that the indicative location will provide for a similar arrangement to the existing access driveway for Section 28 Block 15 which is adjacent to the Site.

Rivett Place is a public road and is classified as an access street. There is no visual indication of pavement failure within Rivett Place and it is therefore considered appropriate that waste vehicles utilise Rivett Place to service the waste requirements of the proposed development. The road width of Rivett Place at the proposed access is approximately 7.5m and the verge is approximately 5.5m. It is anticipated that this width should allow a waste vehicle entering the development Site to be perpendicular at the block boundary.

Kind regards,

Civil Engineer  
**Mott MacDonald**

Units 11 & 12, First Floor, Block C, Trevor Pearcey House,  
 28-30 Traeger Court, Bruce ACT 2617 Australia  
[www.mottmac.com](http://www.mottmac.com) |

T +61 (0)2 6253 1555 | F +61 (0)2 6253 1666 |  
 E [info@mottmac.com](mailto:info@mottmac.com)

**Mott MacDonald - Confidential Communication.** This e-mail is confidential. If you are not the intended recipient, or you have received this e-mail in error, any use, dissemination, or copying is prohibited. Please destroy this transmission (including any attachments), and notify the sender by reply e-mail. Mott MacDonald takes care to ensure that data transmitted is appropriate and that the content is free from viruses or defects. However, we do not warrant that this communication is free from any viruses or defects. We deny any liability for loss or damage caused as a result of the receipt or use of this communication.



**From:** Jatheendran, Lingam [<mailto:Lingam.Jatheendran@act.gov.au>]  
**Sent:** 18 July 2013 3:26 PM  
**To:**  
**Cc:** Grdur, Michael; Arul, Adrian; Breen, Mike J  
**Subject:** RE: TaMS Query - Rivett Section 28 Block 13

Hi

You have to carry out further investigation in relation to (1) existing storm water network in the vicinity to identify possible connection, (2) the current use of the existing footpath and the impact of removing them 3) identify the safe location for vehicular access and the impact on other facilities in the vicinity, (4) any other territory plan issues etc

Please note that TAMS has no knowledge of the subject site, it is the responsibility of the consultant to investigate all the issues in consultation with LDA. TAMS will provide comments once a report is produced.

Regards

**Lingam Jatheendran**  
**Chief Engineer**  
 Asset Acceptance Section | Operational Support Branch | Directorate Services Division  
 Territory & Municipal Services Directorate (TAMS) | ACT Government

☎ Ph: (02) 6207 6592 | 📠 Fax: (02) 6207 7484

**"Great Services - Quality Assets - Better Lifestyles"**



**From:** \_\_\_\_\_  
**Sent:** Friday, 28 June 2013 12:10 PM  
**To:** Jatheendran, Lingam  
**Cc:** Grdur, Michael; Breen, Mike J  
**Subject:** TaMS Query - Rivett Section 28 Block 13

Hi Lingham,

Mott MacDonald is undertaking a Site Investigation Report on behalf the LDA for Rivett Section 28 Block 13. Mott MacDonald is not currently aware of any proposed development for the site however it is listed as a Community Facilities Zone under the Territory Plan.

The following is a brief explanation of the current stormwater and access arrangements indicated on the drawings:

- No stormwater tie for Block 13;
- No vehicular access for Block 13;
- A footpath through the site linking a trunk path and play ground to Rivett shops.

Could you please review the sketch attached and provide in-principal approval for:

- Stormwater maintenance hole and service tie;
- The demolition of a footpath through Block 13;
- A new footpath connection to the Rivett Oval car park; and
- Location of proposed vehicular access to the site

Please do not hesitate to contact me should you require anything further.

Kind Regards,



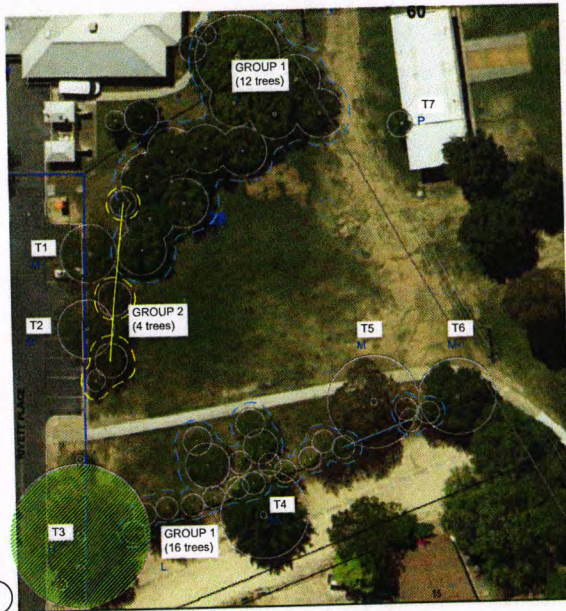






# Appendix D. Tree Assessment





**TREE ASSESSMENT ELEMENTS**

Number: Unique and sequential identification number  
 Name: Botanical name/Height: (m)  
 Trunk: Circumference (m) at 1 metre above natural ground level  
 Canopy: Diameter (m) at the furthest point from the trunk (m)  
 Health: The general health and vigour of the tree  
 Defects / Decay: Structural defects or evidence of internal decay  
 Damage / Disturbance: Evidence of past damage to the tree or disturbance within the root zone  
 Disease: Evidence of past or present disease or insect infestation  
 Stage: Current growth stage (e.g. juvenile, semi-mature, mature or over mature)  
 Quality: Tree quality classification trees are to be classified as being of Exceptional (E), High (H), Medium (M), Poor (P), or Low (L) quality.  
 Tree Act Status: Refer notes below

**Tree 'Regulated' Status by Virtue of Size (On-Lease)**

Under the Tree Protection Act 2005 a tree is termed a Regulated Tree and is to be protected if it is growing on Urban Leased land and has at least one of:  
 \* A height of 12m or more; or  
 \* A trunk circumference of 1.5m (approx 0.5m in diameter) or more at 1m above ground level; or  
 \* Two or more trunks and the total circumference of all the trunks, 1m above ground level, is 1.5m or more; or  
 \* A minimum crown width of 12m or more; and  
 \* Must be alive - all dead trees have been ranked as Non Protected tree.  
 \* Is not a weed species under the Pest Plant & Animals Declaration 2005

**Tree Protected Status**

YES - The tree has a dimension that any activity must be assessed under the Tree Protection Act on Leased land; or is on Government land eg. road verge, park, etc as all trees on Government land are protected.  
 NO - The tree if on Leased land is sufficiently small or declared a Weed Species that it does not require assessment under the Tree Protection Act.  
 NA - Not applicable as Off Lease but often protected as these trees are generally on Government (Unleased) land.

Trees nominated as Protected can only be removed / pruned if approval in writing gained from all applicable Government agencies.

**Future Tree Approvals**

On-Leased land: If a tree has protected status then approval must be gained from TaMS Urban TreeScapes Unit prior to removal, lopping or ground damaging activity.

Off-Leased (Territory) Land: Please note all trees located external to the leased block boundary i.e. the verge or open space, cannot be removed, pruned or damaged without the approval of the Urban TreeScapes Unit, City Services (13 22 81) as on Government land.

**Tree Management:**

Trees within leases require a Tree Management Plan (TMP) and on the verge a Landscape Management Protection Plan (LMPP) outlining removals, pruning, tree protection measures, site access and restorative works issues as part of the design process.

**TREE ASSESSMENT REPORT**

TREES WITHIN LEASES REQUIRE A TREE MANAGEMENT PLAN (TMP) AND ON THE VERGE A LANDSCAPE MANAGEMENT PROTECTION PLAN (LMPP) OUTLINING REMOVALS, PRUNING, TREE PROTECTION MEASURES, SITE ACCESS AND RESTORATIVE WORKS ISSUES AS PART OF THE DESIGN PROCESS.

MATURE MEDIUM & HIGH QUALITY RATED *Eucalyptus mannifera* & *E. sideroxylon* 'Roses' TREES 3 & 5 APPEAR TO BE GROWING & ARE IN GOOD HEALTH.

GROUP 1 TREES ARE SEMI - MATURE *Ulmus parvifolia*. THESE TREES HAVE BEEN PLANTED AS A STAND WITHIN A RELATIVELY TIGHT PLANTING ARRANGEMENT, AS SUCH, SOME TREES WITHIN THE STAND ARE SUPPRESSED & OR HAVE LEANING / UNDER DEVELOPED CANOPIES.

SELECTIVE THINNING MAY BE AN ADVANTAGE TO ALLOW SOME INDIVIDUAL IMPROVED LARGER TREE FORMS



High value rated Tree 3, *Eucalyptus sideroxylon*. Impressive 14m canopy for south western corner of block



Trees 1 & 2 plus Group 2 trees looking South West from within the block



Group 1. Stand of healthy *Ulmus parvifolia* along Northern boundary



Suppressed *Ulmus* in Group 1. Low spread canopy



Dead leader in Group 2 *Ulmus*



Group 3. Stand of *Prunus* along Southern boundary

PLEASE NOTE TREE LOCATIONS & NUMBERS WERE LOCATED ACTPMPI 2012 AERIAL AND WERE VERIFIED FROM SITE INSPECTION UNDERTAKEN BY ENVIRO LINKS DESIGN PTY LTD. JUNE 2013 WHEN TREES WERE DORMANT & IDENTIFYING FEATURES NOT EXHIBITED. TREE NUMBERS ALLOCATED BY ENVIRO LINKS DESIGN.

TREES ASSESSED BY GROUP as being of similar species and attributes (eg. size, health, stage)

**VALUE RANKING - INDIVIDUAL TREES**

The delineation within the value classification is based on the works being on leased land and therefore under the jurisdiction of the TaMS Urban TreeScapes Unit (UTU). All trees on Government Land are regarded as protected trees and can not be removed or damaged or works undertaken near them without the approval of the UTU. (The Tree Act, and Regulated Tree definitions are therefore applicable to leased sites, unless otherwise advised).

**EXCEPTIONAL VALUE (PROTECTED TREE)** - trees that are outstanding examples of their species and have significant visual impact. They have most of the following: mature specimens with grand appearance and stature; may have unusual character; may be a rare species; well balanced; cultural heritage importance; significant scientific value; presents a low hazard/safety risk. Significant value within the landscape context of the site and should be preserved.

**HIGH VALUE (PROTECTED TREE)** - trees that are good examples of their species and have significant visual impact. They have most of the following: high arboricultural value or potential; good form; healthy specimens with good size and little or no epicormic shoots or other arboricultural problems. Good value within the landscape context of the site and should be preserved if at all possible.

**MEDIUM VALUE (PROTECTED TREE)** - trees generally complying with most of the following: reasonable form or reasonable current size with good health / growth potential; healthy specimen with significant growth (or with moderate tree surgery a large tree can be modified from fair to good health, ie can carry some deadwood); has value within the landscape context of the site; presents a medium to low hazard/safety risk. Does not justify special attention of construction expenditure but justifies a minor design adjustment to save or could be removed if necessary. Retain if appropriate to land use and future management cost and risks.

**POOR VALUE (PROTECTED TREE)** - trees generally complying with most of the following: specimen with low growth or poor form and possible health problems; trees of little value; presents a high or very high hazard/safety risk. . Expendable, remove if necessary - retain if appropriate to land use and future management costs and risks.

**LOW VALUE (UN-PROTECTED TREE)** - non-significant tree under the 2005 Tree Protection Act. Trees therefore can range from well established quality trees to poor health small trees of no significance. Some possibly with important landscape impact (e.g. regeneration) or future growth potential to contribute to the landscape in future years. Expendable, remove if necessary - retain if appropriate to land use and future management costs and risks.



**TREE ASSESSMENT SCHEDULE**

ELD No.	Botanical Name	Height (m)	No. Trunks	Trunk circ. (m)	Canopy dia. (m)	Health and Vigour	Structural defects and decay	Past Damage or root disturbance	Disease or infestation	Stage	Quality Rating	Protected Status
G1	<i>Ulmus parvifolia</i>	5-10	1	0.55-1.3	5-10	Good	None apparent	Some past up pruning of lower canopy	None apparent	Semi - Mature	Low	No
G2	<i>Prunus</i> sp.	4-5	1	0.55	4	Fair, some dead branches / trunks	None apparent	Some past up pruning of lower canopy	Some have rotted / dead stem	Semi - Mature	Low	No
G3	<i>Prunus</i> sp.	4-5	1	0.55	4	Fair, some dead branches / trunks	None apparent	Some past up pruning of lower canopy	None apparent	Semi - Mature	Low	No
1	<i>Zelkova serrata</i>	8.5	1	1	8	Good	None apparent	Some past up pruning of lower canopy	None apparent	Mature	Low	No
2	<i>Zelkova serrata</i>	8.5	1	1	8	Good	None apparent	Some past up pruning of lower canopy	None apparent	Mature	High	Yes
3	<i>Eucalyptus sideroxylon</i> 'Roses'	11	1	2.5	14	Good	None apparent	None apparent	None apparent	Mature	Medium	Yes
4	<i>Quercus robur</i>	11	1	1.5	10	Good	None apparent	None apparent	None apparent	Mature	Medium	Yes
5	<i>Eucalyptus mannifera</i>	10.5	1	1.3	14	Good, slight lean to North West	None apparent	None apparent	None apparent	Mature	Medium	Yes (multi trunk)
6	<i>Ulmus</i> sp.	10	4	2.5	12	Good, multi trunk	None apparent	Some past up pruning of lower canopy	None apparent	Mature	Medium	Yes (multi trunk)
7	<i>Ulmus</i> sp.	7	4.00	2	5	Fair, multi trunk suckering right up against building	None apparent	None apparent	None apparent	Mature	Medium	Yes (multi trunk)

For Information	JN	JRD	17/6/13
NO DESCRIPTION	ENVIRO	LINKS	DATE

**NOTES:**  
 \* Copyright and property of Enviro Links Design Pty Ltd. May be used only for the stated project and future related, and in accordance with terms of engagement for which it was commissioned.  
 \* To be used in conjunction with all relevant contracts, specifications, reports, drawings and development approval conditions. (CAD) any corrections to drawings acceptable prior to commencement of works.  
 \* Figure dimensions to be taken by preference to scaled measurements. Dimensions in millimetres unless noted otherwise.  
 \* Where listed For Confirmation.  
 \* Contractor is responsible for bracing all services and stabilising necessary structures and equipment. Contractor to verify dimensions, levels & grade to the locations and prior to commencement of works.  
 \* Retain dimensions and gain approval from Queensland for any retention methods or bracing.  
 \* All work to be done in accordance with the relevant Australian Standards and prior to commencement of works.  
 \* All work to be done in accordance with the relevant Australian Standards and prior to commencement of works.  
 \* All work to be done in accordance with the relevant Australian Standards and prior to commencement of works.  
 \* All work to be done in accordance with the relevant Australian Standards and prior to commencement of works.

CLIENT

LANDSCAPE ARCHITECT

5/61 Daniels Court, PHILLIP ACT 2606  
 PO Box 88, WARRAMANGA ACT 2611  
 (02) 6281 8088 Fax: (02) 6281 8955  
 www.envirolinks.com.au

PROJECT: BLOCK 28 SECTION 13 RIVETT  
 TITLE: TREE ASSESSMENT PLAN

SCALE: 1:1000 @ A3

DATE: 13/17

DWG NO.: TA-01

REVISION: A





# Appendix E. Contamination/Geotechnical Reports

- E.1. Phase 1 Preliminary Contamination Report**
- E.2. Geotechnical Investigation**





**PRELIMINARY CONTAMINATION  
ASSESSMENT  
BLOCK 13 SECTION 28, RIVETT, ACT**

Prepared for:

Land Development Agency

TransACT House  
470 Northbourne Avenue  
Dickson ACT 2602

Report Date: 24 July 2013  
Project Ref: GEOTFYSH09656AA

Written/Submitted by:

Reviewed/Approved by:

Senior Environmental Consultant

Principal Environmental Engineer





24 July 2013

Land Development Agency

TransACT House  
470 Northbourne Avenue  
Dickson ACT 2602

**Attention: Lucia Carson**

Dear Lucia

**RE: Preliminary Contamination Assessment, Block 13 Section 28, Rivett, ACT**

Coffey is pleased to present this report on the Preliminary Contamination for the above site.

We draw your attention to the attached sheets titled "Important Information about your Coffey Environmental Report" which should be read in conjunction with this report.

Thank you for your commission for this work and we look forward to the opportunity of being of assistance with future stages of work at this site. If you require further information or clarification regarding any aspect of this report, please do not hesitate to contact Nick Davison or the undersigned.

For and on behalf of Coffey Environments Australia Pty Ltd

Principal Environmental Engineer



## RECORD OF DISTRIBUTION

No. of copies	Report File Name	Report Status	Date	Prepared for:	Initials
1	GEOTFYSH09656AA-R01.pdf	Final	24 July 2013	LDA	ND
1	GEOTFYSH09656AA -R01.pdf	Final	24 July 2013	Coffey	ND



# CONTENTS

<b>LIST OF ATTACHMENTS</b>	<b>I</b>
<b>ABBREVIATIONS</b>	<b>II</b>
<b>EXECUTIVE SUMMARY</b>	<b>III</b>
<b>1 INTRODUCTION</b>	<b>4</b>
1.1 Background	4
1.2 Objectives	4
1.3 Scope of Work	4
<b>2 SITE LOCATION AND LANDUSE</b>	<b>6</b>
2.1 Site Location	6
2.2 Topography and Drainage	7
2.3 Local Geology and Soils	7
2.4 Regional Hydrogeology and Groundwater Usage	8
<b>3 SITE HISTORY</b>	<b>9</b>
3.1 General	9
3.1.1 Historical Aerial Photographs	9
3.1.2 ACT Environment Protection Authority Records	14
3.1.3 ACT Office of Regulatory Services Records	14
3.1.4 Land Titles and Historical Documents Database	14
3.1.5 Review of Groundwater Bore Records	14
3.1.6 Site Interview Information	14
3.2 Summary of Site History	15
<b>4 INTEGRITY ASSESSMENT OF HISTORICAL DATA</b>	<b>16</b>
<b>5 SITE WALKOVER</b>	<b>17</b>
<b>6 POTENTIAL AREAS OF ENVIRONMENTAL CONCERN AND CONTAMINANTS OF POTENTIAL CONCERN</b>	<b>18</b>



## CONTENTS

7	<b>SAMPLING PLAN</b>	19
8	<b>ASSESSMENT CRITERIA</b>	20
8.1.1	Soil Headspace Screening Criteria	20
8.1.2	Health Investigation Levels (HILs)	21
9	<b>FIELDWORK AND LABORATORY ANALYSIS</b>	24
9.1	Soil Sampling	24
9.2	Laboratory Schedule	24
9.2.1	Quality Assurance/Quality Control (QA/QC)	25
10	<b>RESULTS</b>	26
10.1	Generalised Subsurface Conditions	26
10.2	Headspace Screening Results	26
10.3	Laboratory Analysis Results	26
10.3.1	Quality Assurance/Quality Control	26
10.3.2	Comparison of Results to Adopted Site Assessment Criteria	27
11	<b>CONCLUSIONS AND RECOMMENDATIONS</b>	28
12	<b>LIMITATIONS</b>	29
13	<b>REFERENCES</b>	30



## LIST OF ATTACHMENTS

### Important Information About Your Coffey Environmental Report

#### Tables (within text)

- Table 1: Summary of Site Identification Information
- Table 2: Summary of Historical Aerial Photograph Review
- Table 3: Generalised Headspace Screening Criteria
- Table 4: Adopted Site Assessment Criteria
- Table 5: Laboratory Analysis Schedule

#### Tables (end of text)

- Table LR1: Soil Analysis Results

#### Figures

- Figure 1: Site Locality and Investigation Locations

#### Appendices

- Appendix A: Historical Aerial Photographs
- Appendix B: Territory Plan 2012 – CF Zone
- Appendix C: ACT EPA Record Search
- Appendix D: ORS Dangerous Goods Search
- Appendix E: Historical Documents
- Appendix F: ACT EPWRD Groundwater Bore Search Response
- Appendix G: Site Photographs
- Appendix H: Test Pit Logs
- Appendix I: Laboratory Documentation



## ABBREVIATIONS

<b>ACM</b>	Asbestos Containing Materials
<b>ACT</b>	Australian Capital Territory
<b>ACT EPA</b>	Australian Capital Territory Environmental Protection Authority
<b>ACT EPWR</b>	Australian Capital Territory Environment Protection and Water Regulation
<b>ACT PLA</b>	Australian Capital Territory Planning and Land Authority
<b>AEC</b>	Area of Environmental Concern
<b>AHD</b>	Australian Height Datum
<b>BTEX</b>	Benzene Toluene Ethylbenzene Toluene
<b>COPC</b>	Contaminant of Potential Concern
<b>ESDD</b>	Environment and Sustainable Development Directorate
<b>HIL</b>	Health Investigation Level
<b>HSL</b>	Health Screening Level
<b>GPS</b>	Geographical Positioning System
<b>LDA</b>	Land Development Agency
<b>NSW OEH</b>	New South Wales Office of Environment and Heritage
<b>ORS</b>	Office of Regulatory Services
<b>OCP</b>	Organochlorine Pesticides
<b>OPP</b>	Organophosphorus Pesticides
<b>PAH</b>	Polycyclic Aromatic Hydrocarbons
<b>PID</b>	Photoionisation Detector
<b>TP</b>	Test Pit
<b>TRH</b>	Total Recoverable Hydrocarbons
<b>UST</b>	Underground Ground Storage Tank



## EXECUTIVE SUMMARY

Coffey was commissioned by the Land Development Agency (LDA) to undertake a preliminary contamination assessment of Block 13 Section 28, Rivett, ACT (the Site).

The objective of the work was to provide geotechnical and contamination assessment information to permit due diligence to be carried out for the Site.

The objectives of the assessment were to:

- Assess the potential for contaminating activities to have been carried out at the site that may have caused land contamination; and
- Provide recommendations on further investigations which may be required to supplement the geotechnical review and preliminary contamination assessments (if any).

Coffey undertook a desktop study, site walkover and soil sampling, to assess, at a preliminary level, the potential for soil contamination to be present at the Site. The results of the brief site history study generally indicated that the site was unlikely to have been subject to contaminating activities associated with the historical activities conducted on and nearby the Site. The site appeared to have been generally vacant since at least 1975. A data gap was noted where aerial imaging was not available prior to 1975 but the site appears to not have been developed.

Coffey excavated five test pits to a maximum depth of 1.3m across the Site. No visual, olfactory or screening indications were observed during the soil investigations. All soil samples analysed indicated that concentrations of the contaminants of potential concern tested were below the adopted site assessment criteria for residential land use.

As a result of the investigations conducted during this preliminary assessment, the likelihood of contamination to be present on Site is considered to be low. Further assessment could be carried out to increase the level of confidence in the potential presence of contamination; otherwise an unexpected finds procedure may be able to be adopted for the site during redevelopment to manage contamination should it be identified.

This report must be read in conjunction with the attached "Important Information About Your Coffey Environmental Report" and the statement of limitations in Section 9 of this report.



## 1 INTRODUCTION

### 1.1 Background

Coffey was commissioned by the Land Development Agency (LDA) to undertake a preliminary contamination assessment of Block 13 Section 28, Rivett, ACT (the Site).

The work was completed in general accordance with our proposal Ref: GEOTFYSH09656AA-P02, dated 30 May 2013. The work was commissioned and carried out concurrently with a geotechnical assessment which is reported separately.

We understand that the LDA is the current leaseholder of the property and requires an assessment of the status of the Site with regard to contamination and geotechnical issues for future development.

### 1.2 Objectives

Coffey understood the objective of this project was to provide geotechnical and contamination assessment information to permit due diligence to be carried out for the Site.

The objectives of this assessment were to:

- Assess the potential for contaminating activities to have been carried out at the site that may have caused land contamination; and
- Provide recommendations on further investigations which may be required to supplement the geotechnical review and preliminary contamination assessments (if any).

### 1.3 Scope of Work

Coffey undertook the following scope in accordance with Act Government (Nov 2011) *Information Sheet 7 - Guidance for undertaking preliminary contamination investigations for development purposes*:

- A preliminary desk study to assess site conditions and identify potential areas of environmental concern (AEC) and contaminants of potential concern (COPC), comprising:
  - Review of local published geology, hydrogeology and hydrology;
  - Review of historic aerial photographs held by Surveying and Spatial Data, Environment and Sustainable Development Directorate (ESDD);
  - Contaminated Land Search of records held by the ACT Environment Protection Authority (ACT EPA), ESDD;
  - Review of Office of Regulatory Services records;
  - Bore search of records held by the Environment Protection and Water Regulation, ESDD;
  - Review of historic plans and/or records held by other ACT Government and Commonwealth Government Departments;
  - Review of current and former uses of the site; and
  - Discussions with current and past land managers (if practicable), lessees and site users.
- A site visit to visually assess potential sources of contamination, indications of ground disturbance (such as filling activities) and other visual/olfactory indications of potential contamination, observe



surrounding land uses, topography, drainage, nearby sensitive environments, to add to potential AECs and COPCs;

- The collection and analysis of selected soil samples from geotechnical test pits excavated at the Site;
- Preparation of a Preliminary Contamination Investigation report in general accordance with the requirements set out within the Contaminated Sites Environment Protection Policy, Environment Protection Authority (ACT EPA 2009) and Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites (NSW OEH, 2011); and
- Liaison with ACT EPA to obtain written endorsement of this Preliminary Contamination Assessment.

## 2 SITE LOCATION AND LANDUSE

### 2.1 Site Location

A summary of the Site identification information is presented in Table 1 below. The Site locality is shown in Figure 1.

The Site is an irregularly shaped parcel of land, predominantly well grassed and vacant, fronted by the Rivett Sporting fields to the east, Rivett Place and the Rivett shops to the west and the Salvation Army disposal store and the Reformed Church of Canberra to the north and south, respectively. Coffey inferred the site boundaries based on site features encountered during the walkover. A fence line or other structures were not present to clearly define the boundary.

The Site contains an unsealed access road which services the Sporting field amenities. A Site layout plan is presented in Figure 1. Historical aerial photographs showing the Site and surrounding land use are presented in Appendix A.

**Table 1: Summary of Site Identification Information**

Street Address	Rivett Place, Rivett, ACT	
Title Identifiers	Block 13, Section 28	
Area	Approx. 2,550m <sup>2</sup>	
Grid Co-ordinates (Aust. Map Grid) (Approx)	North	685 136m E 6 086 597m N
	South	685 137m E 6 086 538m N
	East	685 150m E 6 086 574m N
	West	685 106m E 6 086 557m N
District/Division Name	Weston Creek/Rivett	

*Continued*



**Table 1 (Continued): Summary of Site Identification Information**

Zoning and permitted uses (refer Appendix B for permitted uses list)	CF – Community Facilities	
Current Owner(s)	Land and Development Agency	
Current Site Use(s)	Block 13 is currently vacant	
Surrounding Land Use	North	Sporting field sealed car parking area fronting Rivett Sporting fields and Burrangiri Respite Centre
	South	Unsealed car parking associated with the Reformed Church of Canberra
	East	Rivett Sporting Fields and amenities
	West	Rivett Place separates the Site from car parking associated with the Rivett Shops

## 2.2 Topography and Drainage

The western portion of the Site slopes gently to the east; from the higher western portion adjoining the Rivett Shops car park and Rivett Place. The Site grades to relatively level with minor surface undulations in the east where it meets the Rivett Sports field and amenities. Topographical information provided in ACT Planning and Land Authority's online interactive mapping service (ACTmapi) indicates the Site lies at an elevation between 606m to 609m above Australian Height Datum (AHD).

Municipal storm water pits were observed in the Rivett Shops car park to the west of the Site and in the Sports field car park to the north. Some infiltration of surface water is expected to occur within the unsealed and vegetated portions of Site, with runoff diverted to municipal storm water system. Ultimately, surface water runoff is expected to discharge to Weston Creek (approx. 950m east of Site) via the municipal storm water system.

## 2.3 Local Geology and Soils

The 1:50,000 Geology Map of Canberra, Queanbeyan and Environs (Russell 1980) indicates that the Site is underlain Silurian age Deakin Volcanics comprising various tuffs, rhyolite, rhyodacites and agglomerates.

Jenkins (2000) describes the soils of the Site as the transferral landscape *Burra*, with soils identified as typically shallow well drained Rudosols (Lithosols) and Tenosols (Lithosols/Earthy Sands) on crests and upper slopes with moderately deep, moderately well drained Red Kurosols (Red Podzolic soils) and Red Kandosols (Red Earths) on mid- to lower-slopes. Moderately deep, slowly to moderately well drained Brown Chromosols (Yellow Podsolics Soils) and Brown Kandosols (Yellow Earths) are prevalent along drainage lines.

Preliminary Contamination Assessment,  
Block 13 Section 28, Rivett, ACT

## 2.4 Regional Hydrogeology and Groundwater Usage

The 1:100,000 scale hydrogeological map *Hydrogeology of the Australian Capital Territory* (Evans 1984) indicates the site is located on late Silurian Deakin Volcanics comprising various tuffs, rhyolite, rhyodacites and agglomerates. Water quality tends to be variable to poor with dissolve solids concentration less than 500mg/l and a water yield of 0.5-1.0l/s.

The nearest surface water receptor is Weston Creek which is located approximate 950m to the east of the Site. Groundwater levels are inferred to be at a depth approximately similar or slightly higher than the average surface level of Weston Creek (at approximately RL 590m AHD) and are likely to flow in an easterly to north-easterly direction. Groundwater is therefore expected to be at depths greater than 10m below ground surface.



### **3 SITE HISTORY**

#### **3.1 General**

Information on the Site history was obtained from the following sources:

- Review of historic aerial photographs held by Surveying and Spatial Data, Environment and Sustainable Development Directorate (ESDD);
- Contaminated Land Search of records held by the Environment Protection Authority (EPA), ESDD;
- Review of Office of Regulatory Services records;
- Bore search of records held by the Environment Protection and Water Regulation, ESDD;
- Review of historic plans and/or records held by other ACT Government and Commonwealth Government Departments; and
- Discussions with current and past land managers (if practicable), lessees and site users.

##### **3.1.1 Historical Aerial Photographs**

Four historical aerial photographs were received from ACT Planning and Land Authority (ACT PLA) covering a period between 1975 and 2004. Post 2004, imagery available from Google Earth was reviewed with imagery available for 2005, 2006, 2008, 2009, 2011, 2012 and 2013. Table 2 below presents a summary of observations made following the historical aerial photograph review. Historical aerial photographs (1975 – 2004) are presented in Appendix A.

**Table 2: Summary of Historical Aerial Photograph Review**

Image Date	Observations
1975	<p><b><u>Condition</u></b></p> <p>The Site appears to be cleared and vacant with construction of the Reformed Church of Canberra building underway to the Site's south. The Rivett shops are visible although the Respite Centre to the Site's north is yet to be constructed.</p> <p><b><u>Uses</u></b></p> <p>The Site appears vacant and is possibly utilised as an access point for construction to the south.</p> <p><b><u>Water Courses</u></b></p> <p>No water courses are apparent in the 1975 image.</p> <p><b><u>Structures</u></b></p> <p>No Buildings are evident on Site.</p> <p><b><u>Surrounding Lands</u></b></p> <p>North – A car parking area fronts the western extent of the Rivett Sporting Fields and cleared vacant land comprises the majority of lands to the north of Site.</p> <p>South – Construction of the Reformed Church of Canberra building is currently underway in the 1975 image.</p> <p>East – The Rivett Sporting Field is apparent although no amenities are evident in the 1975 image.</p> <p>West – The Rivett Shops are apparent along with Rivett Place and the Rivet Shops car park in its current alignment.</p>

*Continued*



**Table 2 (Continued): Summary of Historical Aerial Photograph Review**

Image Date	Observations
1985	<p><b><u>Condition</u></b> The Site appears well grassed and vacant.</p> <p><b><u>Uses</u></b> The Site appears vacant.</p> <p><b><u>Water Courses</u></b> No additional changes are evident.</p> <p><b><u>Structures</u></b> No additional structures are evident, nor is it apparent that any have been removed since 1975.</p> <p><b><u>Surrounding Lands</u></b> North – The Rivett Sporting Field amenities blocks are evident along with the sealed car park servicing Rivett Sports Fields. South – The Reformed Church of Canberra building is present in what appears to be its current configuration. East – The Rivet Sporting Fields and amenity block has been constructed in the period 1975 - 1985. West – No changes to the Rivett Shops (or associated parking) are evident.</p>

*Continued*

**Table 2 (Continued): Summary of Historical Aerial Photograph Review**

Image Date	Observations
1995	<p><b><u>Condition</u></b></p> <p>The Site appears mostly well grassed and vacant. A trafficked area is apparent to the rear of the Rivet Sports Field amenity block. Landscaping of the north-eastern corner is apparent with a stand of trees now present linking the Sporting Field car park with Rivett Place.</p> <p><b><u>Uses</u></b></p> <p>The Site is vacant.</p> <p><b><u>Water Courses</u></b></p> <p>No additional changes to the Site's (or surrounding) hydrology are evident.</p> <p><b><u>Structures</u></b></p> <p>No additional structures are evident, nor is it apparent that any have been removed since 1985.</p> <p><b><u>Surrounding Lands</u></b></p> <p>North – The Rivett Sporting Field amenities blocks are evident along with the sealed car park servicing Rivett Sports Fields. The Aged Respite Care Centre has been constructed in the period 1985 - 1995</p> <p>South – The Reformed Church of Canberra building is present in what appears to be its current configuration.</p> <p>East – No changes to the Sporting fields (or associated amenities or parking) are evident.</p> <p>West – No changes to the Rivett Shops (or associated parking) are evident.</p>
2004	<p><b><u>Condition</u></b></p> <p>No changes to the Site's (or surrounding) condition are evident.</p> <p><b><u>Uses</u></b></p> <p>The Site appears vacant.</p> <p><b><u>Water Courses</u></b></p> <p>No additional changes are evident.</p>

*Continued*



**Table 2 (Continued): Summary of Historical Aerial Photograph Review**

Image Date	Observations
2004	<p><b><u>Structures</u></b></p> <p>No additional structures are evident, nor is it apparent that any have been removed since 1995.</p> <p><b><u>Surrounding Lands</u></b></p> <p>North – No additional structures are evident, nor is it apparent that any have been removed since 1995.</p> <p>South – No additional structures are evident, nor is it apparent that any have been removed since 1995.</p> <p>East – No changes to the Sporting fields (or associated amenities or parking) are evident.</p> <p>West – No changes to the Rivett Shops (or associated parking) are evident.</p>
2005-2013 (Google Earth Review)	<p><b><u>Condition</u></b></p> <p>No major changes in Site condition are apparent.</p> <p><b><u>Uses</u></b></p> <p>No apparent changes in Site use are apparent.</p> <p><b><u>Water Courses</u></b></p> <p>No additional changes to the Site's (or surrounding) hydrology are evident.</p> <p><b><u>Structures</u></b></p> <p>No additional structures are evident, nor is it apparent that any have been removed since 2004.</p> <p><b><u>Surrounding Lands</u></b></p> <p>North – No additional structures are evident, nor is it apparent that any have been removed since 1995.</p> <p>South – No additional structures are evident, nor is it apparent that any have been removed since 1995.</p> <p>East – No changes to the Sporting fields (or associated amenities or parking) are evident.</p> <p>West – No changes to the Rivett Shops (or associated parking) are evident.</p>

### 3.1.2 ACT Environment Protection Authority Records

Coffey submitted a request to the ACT EPA on 24 June 2013 for a search of records held pertaining to the Site. ACT EPA indicated Block 13 Section 28 is not recorded on the ACT EPA's contaminated sites database or geographic information system and EPA has not issued any environment protection orders for the Site under section 91C(1), 91D(1) or 125(4) of the *Environment Protection Act 1997*.

A copy of the correspondence received from ACT EPA, referenced as 97/5032 is provided as Appendix C.

### 3.1.3 ACT Office of Regulatory Services Records

A search of the Dangerous Goods Database and Dangerous Substances Register maintained by the Office of Regulatory Services was undertaken to evaluate whether dangerous substances have been stored at the site. The findings of this search indicate that there are no records of dangerous substances being stored at this Site. However, as standard practice, Coffey notes that under the Dangerous Goods Act 1975 (1975 to April 2004), tanks of 50,000L which contained diesel were not required to be licensed with WorkCover, only if the capacity was 50,001L and above.

A copy of the correspondence received from ORS, dated as 28 June 2013 is provided as Appendix D.

### 3.1.4 Land Titles and Historical Documents Database

A review of the ACT Office of Regulatory Services Land Titles and Historical Documents database ("Tarquin") indicates the following:

- No title issued for Block 13 Section 28 Rivett; and
- The Block is therefore classified as 'Administrative Parcel – No Title Issued'.

The client's representative (Mott Macdonald Hughes Trueman) provided historical documentation (circa 1969) that identified a former drainage line entering the Site's eastern boundary from the adjoining Rivett Sports fields. The documentation appears to identify the local storm water network although it is not clear if the drainage line was filled as part of these works or at a later date (i.e. pre-1975). A copy of the sketch is provided as Appendix E.

### 3.1.5 Review of Groundwater Bore Records

A search of groundwater bores by ACT Government, Environment and Sustainable Development Directorate indicated that there were no registered water abstraction bores present within 1 km radius around the Site. Correspondence received from ACT ESDD, dated 24 June 2013 is provided as Appendix F.

### 3.1.6 Site Interview Information

No additional practical sources of anecdotal historical information were identified during the course of this assessment.



### **3.2 Summary of Site History**

The following is a summary of the history of the site:

- The Site appeared to have been cleared and vacant since at least 1975. No structures have been noted on site since 1975; and
- Between 1975 and 2013, the general area has been unchanged with the Site remaining vacant and grass covered with the exception of vehicle trafficking during construction of the Reformed Church of Canberra building and currently, servicing the Sports fields amenity building.

#### 4 INTEGRITY ASSESSMENT OF HISTORICAL DATA

The following sources of historical data were relied upon for this assessment:

- Information provided by the Principal client (LDA) and the client's representatives;
- Historic aerial photographs held by Surveying and Spatial Data, Environment and Sustainable Development Directorate (ESDD) and Google Earth;
- Records and Historical aerial imagery held by the Environment Protection Authority (EPA), ESDD;
- Records held by Office of Regulatory Services;
- Groundwater Bore records held by the Environment Protection and Water Regulation, ESDD;
- Historic plans and/or records held by other ACT Government and Commonwealth Government Departments.

The observations made during the walkover were generally consistent with the records provided by third parties.

Based on the information retrieved as part of this assessment, some gaps are noted in the site history information and are as follows:

- Information on the history of the site prior to 1975 was not well documented. No definitive information or imagery was available regarding the status or use of the Site prior to 1975. It is likely the Site was cleared circa 1920 as part of the development of Canberra. It is possible that light agricultural activities/grazing were conducted onsite following clearing.



## 5 SITE WALKOVER

An environmental scientist made observations of the site during a site walkover and the excavation of test pits on 5 July 2013. A summary of observations made during this walkover and subsurface investigation is provided below with Site photographs in Appendix G.

The following site features were observed during the site walkover:

- The Site was a vacant and predominantly well grassed with a filled (i.e. road base) access road located behind the Rivett Sports Field amenity building (refer Photograph 1);
- The Site sloped gently in the western portion descending from Rivett Place to the relatively level Rivett Sports Fields (refer Photograph 2);
- Indications of minor cut/fill earthworks (refer Photograph 3) were apparent based on the local topography of the Site (i.e. gentle benching of areas within the western portion of the Site associated with Rivett Place and the Rivett Shops car park);
- Vegetation was restricted to individual mature trees along the Site's western and northern boundaries (refer Photograph 4);
- No indications of anthropogenic fill were observed during the site walkover;
- No potential asbestos containing material (ACM) was observed during the site walkover;
- No surface indications of existing or former aboveground or underground storage tanks (AST and UST respectively) were noted on the Site; and
- No apparent visual indications of site contamination were observed during this site walkover.

## **6 POTENTIAL AREAS OF ENVIRONMENTAL CONCERN AND CONTAMINANTS OF POTENTIAL CONCERN**

The site history study did not directly identify potentially contaminating activities to have occurred on or nearby the site that would suggest the potential for contamination to exist. The integrity assessment noted that historical data (particularly in the form of aerial imagery) was not available prior to 1975, therefore there is a data gap and the potential for some form of contaminating activity to have occurred cannot be totally excluded.



## 7 SAMPLING PLAN

The NSW EPA (1995) Sampling Design Guidelines recommend about eight sampling location to assess a site with an area of about 2,550m<sup>3</sup> with respect to contamination, subject to the results of the site history. For this assessment, preliminary soil sampling and analysis was carried out from five geotechnical test pit locations. The test pits were used to assess the likely subsurface conditions at the site and were located to gain reasonable site coverage.

The samples were selected for analysis based on field observations for a suite of potential contaminants.

## **8 ASSESSMENT CRITERIA**

### **8.1.1 Soil Headspace Screening Criteria**

For the purposes of this report the generalised headspace screening criteria presented in Table 4 have been used as a guide to the potential for volatile hydrocarbon contamination. These criteria have been developed by Coffey based on our experience (where monitoring for volatile organic compounds has occurred) to assist in the assessment of hydrocarbon contamination levels in soil. It is important to note that these generalised criteria are only a guide and that the PID has a different response to different contaminants.



**Table 3: Generalised Headspace Screening Criteria**

PID reading as ppm isobutylene	Generalised soil vapour content description relating to volatile petroleum hydrocarbon contamination
<20 ppm	NEGLIGIBLE
20 to 60 ppm	LOW
60 - 300 ppm	MODERATE
>300 ppm	SIGNIFICANT

**8.1.2 Health Investigation Levels (HILs)**

The soil investigation levels presented in National Environment Protection (Assessment of Site Contamination) Measure (2013) Schedule B(1) 'Investigation Levels for Soil and Groundwater, NEPC are the criteria used in ACT for chemical contaminants in soil.

The Site is currently zoned CF Community Facilities as per <http://www.actmapi.act.gov.au/home.html>. A criterion of "no asbestos detected" has been adopted as a screening level for assessing soil asbestos analytical results. If asbestos was detected, the Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia, May 2009 prepared by the Western Australian Department of Health, which is endorsed by ACT EPA, are to be considered where applicable.

The results of soil analyses of samples obtained from the Site will be assessed against the Health based threshold concentrations for Residential land use, Column A (HIL A – Residential with garden/accessible soil (home grown produce < 10% fruit and vegetable intake (no poultry), includes child care centres, preschools and primary schools). For petroleum hydrocarbons, we have adopted conservative screening criteria of the laboratory reporting limit. Health screening levels are available for vapour intrusion and ecological investigation levels in the NEPM and would be used if required. Results have also been compared to NSW EPA (1994) Guidelines for Assessing Service Station Sites.

Ecological Investigation Levels are available for some contaminants and discussed in NEPM (1999). The most conservative concentration for each contaminant has been adopted as initial screening criteria, above which further assessment would be required.

A summary of the adopted soil investigation levels is presented in Table 4.

**Table 4: Adopted Site Assessment Criteria**

Analyte	Health-based Investigation Levels (HILs) (mg/kg)	Ecological Investigation Levels (EILs) (mg/kg)
	HIL A	Urban Residential and public open space
<b>METALS / METALLOIDS (Total)</b>		
Arsenic	100 <sup>1</sup>	100 <sup>2a</sup>
Cadmium	20 <sup>1</sup>	..
Chromium <sup>1a</sup>	100 <sup>1</sup>	190 <sup>2a</sup>
Copper	6,000 <sup>1</sup>	60 <sup>2a</sup>
Lead	300 <sup>1</sup>	1,100 <sup>2a</sup>
Mercury (inorganic)	40 <sup>1</sup>	..
Nickel	400 <sup>1</sup>	30 <sup>2a</sup>
Zinc	7,400 <sup>1</sup>	70 <sup>2a</sup>
<b>ORGANICS</b>		
Aldrin + Dieldrin	6 <sup>1</sup>	..
Chlordane	50 <sup>1</sup>	..
DDT	-	180 <sup>2a</sup>
DDT + DDD + DDE	240 <sup>1</sup>	
Heptachlor	6 <sup>1</sup>	..
Endosulfan	270 <sup>1</sup>	..
Endrin	10 <sup>1</sup>	..
Heptachlor	6 <sup>1</sup>	..
Methoxychlor	300 <sup>1</sup>	..
Toxaphene	20 <sup>1</sup>	..
PCB (Total)	1 <sup>1</sup>	..
Total PAHs	300 <sup>1</sup>	..
Benzo(a)pyrene TEQ <sup>3</sup>	3 <sup>1</sup>	..
<b>PETROLEUM HYDROCARBONS</b>		
TRH C6 – C9	<20 <sup>4</sup> / 65 <sup>5</sup>	..
TRH C110 – C14	<20 <sup>4</sup>	..
TRH C15 – C28	<50 <sup>4</sup>	..
TRH C29 – C36	<50 <sup>4</sup>	..
TRH C10 – C36 (Total)	<50 <sup>4</sup> / 1,000 <sup>5</sup>	..
Benzene	<0.1 <sup>4</sup> / 1 <sup>5</sup>	..



**Table 4 (Continued): Adopted Site Assessment Criteria**

PETROLEUM HYDROCARBONS		
Toluene	<0.1 <sup>4</sup> / 130 <sup>5</sup>	..
Ethylbenzene	<0.1 <sup>4</sup> / 50 <sup>5</sup>	..
Xylenes	<0.3 <sup>4</sup> / 25 <sup>5</sup>	..
Napthalene	<0.5 <sup>4</sup> / 170 <sup>5</sup>	..

<sup>1</sup> NEPC (2013) *National Environmental Protection (Assessment of Site Contamination) Measure (NEPM)*. Adapted from Table 1(A)1.

<sup>1a</sup> Based on Cr (VI)

<sup>2</sup> NEPC (2013) *National Environmental Protection (Assessment of Site Contamination) Measure (NEPM)*. Adapted from Tables 1B(1) to (5) – *Generic EILs*

<sup>2a</sup> Conservatively based solely on soil specific added contaminant limit (ACL) for the aged metal – lowest value in table for urban residential/public open space (where relevant)

<sup>3</sup> HIL is based on the 8 carcinogenic PAH's and their TEF's potency relative to B(a)P adopted by CCME (2008). The B(a)P TEQ is calculated by multiplying the concentration of each carcinogenic PAH in the sample by its B(a)P TEF and summing the product.

<sup>4</sup> Limit of Reporting (LOR) conservatively set as initial screening criteria

<sup>5</sup> Threshold concentrations adopted from NSW EPA (1994) *Guidelines for Assessing Service Station Sites*; Table 3 – Threshold Concentrations for sensitive land use - soils

## 9 FIELDWORK AND LABORATORY ANALYSIS

Five test pits were excavated on the 5 July 2013 in the full time presence of an environmental scientist as part of a concurrent geotechnical assessment. Visual and olfactory observations were recorded for each of the five test pits (TP1 – 5) with two representative samples collected from each test pit for chemical analysis. The test pit locations were located using a GPS with locations shown in Figure 1. Copies of the logs of the test pit locations are included in Appendix H.

### 9.1 Soil Sampling

During test pitting, soil samples were collected either directly from the walls of the test pit or from soils from the centre of the excavator bucket, which had not come into contact with the bucket.

Soil samples were collected with a new pair of nitrile gloves.

Soil samples were generally collected within the fill materials at the surface, where there was visual or olfactory evidence of contamination (if any) or at major changes in stratigraphy. The soil was placed into clean 250mL glass jars, which were sealed with Teflon lined caps, labelled and placed directly into ice-cooled chests for transport to the laboratory.

Headspace screening tests were carried out using a Mini Rae 2000 photoionisation detector (PID) fitted with a 10.6eV lamp and calibrated with isobutylene gas at a concentration of 100ppm. This instrument allows rapid, semi quantitative analysis of ionisable volatile organic compounds in the soil.

### 9.2 Laboratory Schedule

Table 5 identifies the analysis schedule executed for this assessment.

**Table 5: Laboratory Analysis Schedule**

Test Pit	Sample ID	Depth (m bgs)	Analysis
TP1	TP1-1	0.2 – 0.3	Metals/TRH/BTEX/PAH/OCP/OPP/Asbestos
	TP1-2	0.4 – 0.5	Sample not analysed
TP2	TP2-1	0.2 – 0.3	Metals/Asbestos
	TP2-2	0.4 – 0.5	Sample not analysed
TP3	TP3-1	0.2 – 0.3	Metals/TRH/BTEX/PAH/OCP/OPP/Asbestos
	TP3-2	0.4 – 0.5	Metals/TRH/BTEX/PAH/OCP/OPP/Asbestos

*Continued*



**Table 5 (Continued): Laboratory Analysis Schedule**

Test Pit	Sample ID	Depth (m bgs)	Analysis
TP4	TP4-1	0.2 – 0.3	Metals/Asbestos
	TP4-2	0.4 – 0.5	Sample not analysed
TP5	TP5-1	0.2 – 0.3	Metals/TRH/BTEX/PAH/OCP/OPP/Asbestos
	TP5-2	0.4 – 0.5	Sample not analysed

*Notes:*

*TRH = Total Recoverable Hydrocarbons BTEX = Benzene, Toluene, Ethylbenzene, Xylene PAH = Polycyclic Aromatic Hydrocarbons Metals = arsenic, cadmium, chromium, copper, lead, nickel, mercury, zinc OCP = Organochlorine Pesticides OPP = Organophosphorus Pesticides*

The primary laboratory was Eurofins MGT with all primary and duplicate metals, hydrocarbons and pesticide samples analysed by this laboratory.

The secondary laboratory was Envirolab with triplicate samples for metals, hydrocarbons and pesticide analysed by this laboratory.

Asbestos identification was subcontracted by Eurofins MGT to Liability & Risk Management Consulting with all asbestos identification conducted by LRM.

All laboratories were NATA accredited for the tests performed.

**9.2.1 Quality Assurance/Quality Control (QA/QC)**

Field work was conducted by a Coffey Environmental Scientist in general accordance with Coffey Standard Operating Procedures. The QA/QC results are discussed in Section 10.3.1.

## 10 RESULTS

### 10.1 Generalised Subsurface Conditions

The generalised subsurface conditions encountered across the site are summarised below:

<b>FILL</b>	Clayey SAND. Fine to coarse grained, black medium plasticity clay. Topsoil's typically extended to 0.3 m bgs.
<b>RESIDUAL / EXTREMELY WEATHERED ROCK</b>	CLAY/Clayey SAND/Sandy CLAY. Clays were typically medium to high plasticity, red-brown to grey-brown. Sands were fine to medium grained

No unusual odours were noted during sampling. No visual evidence of ACM was noted during excavations. No groundwater inflows were observed.

### 10.2 Headspace Screening Results

PID results are included on the test pit logs (Appendix G). Soil samples screened recorded negligible readings (0.0ppm). This is generally consistent with field observations and the laboratory tested soil samples. This indicates that significant volatile ionisable contamination was not apparent in the soil samples screened.

### 10.3 Laboratory Analysis Results

#### 10.3.1 Quality Assurance/Quality Control

Coffey assessed the laboratory data against predetermined Data Quality Objectives (DQOs) and Data Quality Indicators (DQIs) (completeness, comparability, representativeness, precision, and accuracy) for both field and laboratory procedures and results. A copy of the quality control analysis results is presented in Appendix I.

Based on our assessment, the following comments can be made regarding soil samples.

- A duplicate soil sample was inadvertently not analysed for this batch of samples. The laboratory precision can therefore not be directly assessed. Laboratory duplicates were carried out by the laboratory and these were within acceptable control limits. This is not considered significant.
- A wash blank sample was not collected as samples were collected from soils not touching the excavator bucket. The potential for cross-contamination between sampling locations is considered negligible.

Samples analysed for volatile contaminants (such as BTEX compounds) were accompanied by a trip spike and trip blank sample. Analysis of these QA samples indicated that volatile losses and cross contamination were unlikely to have occurred.

The QA/QC results indicate that the laboratory data is useable and adequately represents concentrations of contaminants at the sampling locations.



### **10.3.2 Comparison of Results to Adopted Site Assessment Criteria**

The laboratory results are presented in Table LR1. No sample was found to contain COPC in excess of the adopted site assessment criteria. No BTEX, TPH, PAH, PCB, OCP or OPP was recorded above the Limits of Reporting (LOR). Concentrations of metals were below the adopted site assessment criteria in all samples.

No asbestos was detected in samples submitted for asbestos analysis.

## 11 CONCLUSIONS AND RECOMMENDATIONS

Coffey undertook a desktop study, site walkover and soil sampling, to assess, at a preliminary level, the potential for soil contamination to be present at the Site. The results of the brief site history study generally indicated that the site was unlikely to have been subject to contaminating activities associated with the historical activities conducted on and nearby the Site. A data gap was noted where aerial imaging was not available prior to 1975 but the site appears to not have been developed.

Coffey excavated five test pits to a maximum depth of 1.3m bgs across the Site. No visual, olfactory or screening indications were observed during the soil investigations. All soil samples analysed indicated that concentrations of the contaminants of potential concern tested were below the adopted site assessment criteria for residential land use.

As a result of the investigations conducted during this preliminary assessment, the likelihood of contamination to be present on Site is considered to be low. Further assessment could be carried out to increase the level of confidence in the potential presence of contamination; otherwise an unexpected finds procedure may be able to be adopted for the site during redevelopment to manage contamination should it be identified.



## 12 LIMITATIONS

The findings contained in this report are the result of discrete/specific methodologies used in accordance with normal practices and standards. To the best of our knowledge, they represent a reasonable interpretation of the general condition of the parts of the site assessed at the time the investigations were carried out.

Under no circumstances, however, can it be considered that these findings represent the actual state of the site at all points. This report does not provide geotechnical information or information of hazardous building materials within buildings or buried services/structures.

### 13 REFERENCES

- Coffey (2013), *Geotechnical Investigation, Due diligence Assessment, Block B, Section 28, Rivett , ACT*
- Australian Capital Territory Environment Protection Authority (2009) *Contaminated Sites Environment Protection Policy, November 2009*. Australian Capital Territory, Canberra.
- Russel, E.A. (1980) *Geology Map of Canberra, Queanbeyan and Environs*. 1:50,000 scale map. Bureau of Mineral Resources, Geology and Geophysics, Canberra.
- Evans, R. (1984) *Hydrogeology of Australian Capital Territory and Environs* 1:100,000 scale map. Bureau of Mineral Resources, Geology and Geophysics, Canberra.
- Jenkins, J.R. (2000). *Soil Landscapes of the Canberra 1:100 000 Sheet*. Department of Land and Water Conversation, Queanbeyan.
- National Environment Protection Council (2013). National Environment Protection (Assessment of site Contamination) Measure; *Schedule B(1) – Guideline on Investigation Levels for Soil and Groundwater*. NEPC, Australia
- New South Wales EPA (1994). *Guidelines for Assessing Service Station Site*. NSW EPA, Chatswood, NSW, Aust.
- New South Wales Office of Environment and Heritage (2011) *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (2nd edition). NSW OEH, Sydney.



## Important information about Coffey Environmental Report

Uncertainties as to what lies below the ground on potentially contaminated sites can lead to remediation costs blow outs, reduction in the value of the land and to delays in the redevelopment of land. These uncertainties are an inherent part of dealing with land contamination. The following notes have been prepared by Coffey to help you interpret and understand the limitations of your report.

### **Your report has been written for a specific purpose**

---

Your report has been developed on the basis of a specific purpose as understood by Coffey and applies only to the site or area investigated. For example, the purpose of your report may be:

- To assess the environmental effects of an on-going operation.
- To provide due diligence on behalf of a property vendor.
- To provide due diligence on behalf of a property purchaser.
- To provide information related to redevelopment of the site due to a proposed change in use, for example, industrial use to a residential use.
- To assess the existing baseline environmental, and sometimes geological and hydrological conditions or constraints of a site prior to an activity which may alter the sites environmental, geological or hydrological condition.

For each purpose, a specific approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible, quantify risks that both recognised and unrecognised contamination pose to the proposed activity. Such risks may be both financial (for example, clean up costs or limitations to the site use) and physical (for example, potential health risks to users of the site or the general public).

### **Scope of Investigations**

---

The work was conducted, and the report has been prepared, in response to specific instructions from the client to whom this report is addressed, within practical time and budgetary constraints, and in reliance on certain data and information made available to Coffey. The analyses, evaluations, opinions and conclusions presented in this report are based on those instructions, requirements, data or information, and they could change if such instructions etc. are in fact inaccurate or incomplete.

### **Subsurface conditions can change Interpretation of factual data**

---

Subsurface conditions are created by natural processes and the activity of man and may change with time. For example, groundwater levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions which existed at the time of the subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. Consult Coffey to be advised how time may have impacted on the project and/or on the property.

### **Interpretation of factual data**

---

Environmental site assessments identify actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from indirect field measurements and sometimes other reports on the site are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how well qualified, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of Coffey through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other problems encountered on site.

### **Your report will only give preliminary recommendations**

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only Coffey, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered with redevelopment or on-going use of the site. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and Coffey cannot be held responsible for such misinterpretation.

### **Your report is prepared for specific purposes and persons**

To avoid misuse of the information contained in your report it is recommended that you confer with Coffey before passing your report on to another party who may not be familiar with the background and the purpose of the report. In particular, a due diligence report for a property vendor may not be suitable for satisfying the needs of a purchaser. Your report should not be applied for any purpose other than that originally specified at the time the report was issued.

### **Interpretation by other professionals**

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain Coffey to work with other professionals who are affected by the report. Have Coffey explain the report implications to professionals affected by them and then review plans and specifications produced to see how they have incorporated the report findings.

### **Data should not be separated from the report**

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs

(assembled by field personnel), field testing and laboratory evaluation of field samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

### **Contact Coffey for additional assistance**

Coffey is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to land development and land use. It is common that not all approaches will be necessarily dealt with in your environmental site assessment report due to concepts proposed at that time. As a project progresses through planning and design toward construction and/or maintenance, speak with Coffey to develop alternative approaches to problems that may be of genuine benefit both in time and cost.

### **Responsibility**

Environmental reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents. Responsibility clauses do not transfer appropriate liabilities from Coffey to other parties but are included to identify where Coffey's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from Coffey closely and do not hesitate to ask any questions you may have.



## Tables

**Preliminary Contamination Assessment,  
Block 13 Section 28, Rivett, ACT**



Table LRI  
Soil Analysis Results  
LDA - Rivett Preliminary Contamination Assessment

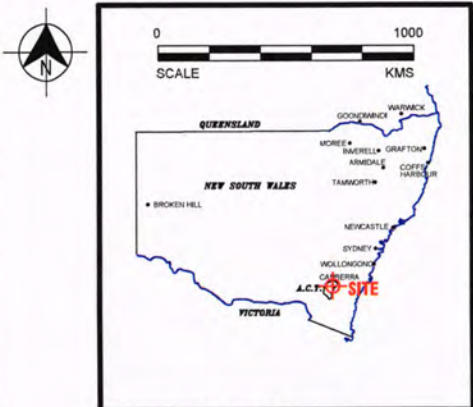
Chem. Group	ChemName	Units	EQL	NEPM 2013 HIL A	NEPM 2013 EL	NSW EPA 1994	Sample ID	TP1-1	TP2-1	TP3-1	TP3-2	TP4-1	TP5-1	
							Date	5/07/2013	5/07/2013	5/07/2013	5/07/2013	5/07/2013	5/07/2013	
Asbestos	Asbestos						ACT EPA							
							No Asbestos	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	
	TRH OS-C0	mg/kg	20	<20 <sup>1</sup> , 65 <sup>1</sup>				<20	<20	<20	<20	<20	<20	
	TRH C10-C14	mg/kg	20	<20 <sup>1</sup>				<20	<20	<20	<20	<20	<20	
	TRH C15-C28	mg/kg	100	<50 <sup>1</sup>				<50	<50	<50	<50	<50	<50	
BTEX	TRH C29-C36	mg/kg	100	<50 <sup>1</sup>				<50	<50	<50	<50	<50	<50	
	TRH C10-C36 (Total)	mg/kg	100	<50 <sup>1</sup> , 1000 <sup>1</sup>				<50	<50	<50	<50	<50	<50	
	Benzene	mg/kg	0.1			1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
	Toluene	mg/kg	0.1			180		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
	Ethylbenzene	mg/kg	0.1			50		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Inorganics	Xylene (m & p)	mg/kg	0.2			25		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
	Xylene (o)	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
	Xylene Total	mg/kg	0.3					<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	
	Naphthalene	mg/kg	0.5			170 <sup>2a</sup>		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	Moisture Content (dried @ 103°C)	%	0.1					10	11	12	12	12	13	
Metals	Arsenic	mg/kg	2	100 <sup>1</sup>	100 <sup>2a</sup>			4	3.6	3.7	<2	<2	<2	
	Cadmium	mg/kg	0.4	20 <sup>1</sup>				<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	
	Chromium	mg/kg	5	100 <sup>1</sup>	100 <sup>2a</sup>			12	11	17	12	9.7	10	
	Copper	mg/kg	5	6000 <sup>1</sup>				<5	<5	<5	<5	<5	<5	
	Lead	mg/kg	5	300 <sup>1</sup>	1100 <sup>2a</sup>			10	11	12	8.3	7.7	7.9	
	Mercury	mg/kg	0.1	40 <sup>1</sup>				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
	Nickel	mg/kg	5	400 <sup>1</sup>	30 <sup>2a</sup>			<5	<5	<5	<5	<5	<5	
	Zinc	mg/kg	5	7400 <sup>1</sup>	70 <sup>2a</sup>			7.8	11	9.5	11	14	22	
	OCP	M,4-DOE	mg/kg	0.05	240 <sup>1</sup>				<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
		a-BHC	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin		mg/kg	0.05	6 <sup>1</sup>				<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
b-BHC		mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Chlordane		mg/kg	0.1	50 <sup>1</sup>				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
d-BHC		mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
DDD		mg/kg	0.05	240 <sup>1</sup>				<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
DDT		mg/kg	0.05	240 <sup>1</sup>	180 <sup>2a</sup>			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Dieldrin		mg/kg	0.05	6 <sup>1</sup>				<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Endosulfan I		mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Endosulfan II		mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Endosulfan sulfate		mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Endrin		mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Endrin aldehyde		mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Endrin ketone		mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
a-BHC (Lintane)		mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Heptachlor		mg/kg	0.05	6 <sup>1</sup>				<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Heptachlor epoxide		mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Hexachlorobenzene		mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Methoxychlor		mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Permethrin		mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Triphenylphosphate (sur.)		%	1						93	113	80	99	99	
Tetrachloro-m-xylene (sur.)		%	1						108	143	124	126	126	
OPP		Acetaminophen	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
		Chloroform	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Dimethyl-O	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
	Diazinon	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
	Dichlorvos	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
	Disulfoton	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
	Ethion	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
	Ethionop	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
	Fenitrothion	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
	Fenprothion	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
	Fenitrothion	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
	Methidathion	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
	Methyl parathion	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
	Mevinphos (Phosdrin)	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
	Naled (Chrom)	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	Phorate	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
	Ronnel	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
	Triphenylphosphate	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
	Toluthion	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
	Triphenylphosphate (sur.)	%	1						102	95	86	103	103	
PAH	Acenaphthene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	Acenaphthylene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	Anthracene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	Benzo(a)anthracene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	Benzo(a)pyrene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	Benzo(b)fluoranthene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	Benzo(k)fluoranthene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	Benzo(e)fluoranthene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	Chrysene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	Dibenz(a,h)anthracene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	Fluoranthene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	Fluorene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	Indene(1,2,3-c-d)pyrene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	Phenanthrene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	Pyrene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	Total PAHs	mg/kg	0.5	300 <sup>1</sup>				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	Benzo(a)pyrene TEQ	mg/kg	0.5	3 <sup>1</sup>				0.6	0.6	0.6	0.6	0.6	0.6	

Notes:  
<sup>1</sup> NEPC (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEM) Adopted from Table 1A(1)  
<sup>2a</sup> Based on Cr 0/0  
<sup>3</sup> NEPC (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEM) Adopted from Table 1B(1) to (5) - Generic ELs  
<sup>4</sup> Concentrations based on dry weight (excluding water content) and (L) for the upper meter - concentrations in table for upper meter only (where relevant)  
<sup>5</sup> HL is based on the 8 carcinogenic PAHs and their TEF's toxicity relative to B[a]P adopted by CCME (2008). The B[a]P TEQ is calculated by multiplying the concentration of each carcinogenic PAH in the sample by its B[a]P TEF and summing the product.  
<sup>6</sup> Limit of Reporting (LOR) concentration per as listed screening criteria  
<sup>7</sup> Threshold concentrations selected from NEPC EPA 1994 Guidelines for Assessing Serious Sites: Table 3 - Threshold Concentrations for sensitive land use - soil.



# Figures

**Preliminary Contamination Assessment,  
Block 13 Section 28, Rivett, ACT**

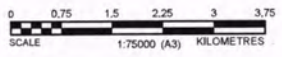


GENERAL AREA MAP



REGIONAL AREA MAP

© OpenStreetMap contributors, CC-BY-SA



LEGEND

TEST PIT LOCATIONS

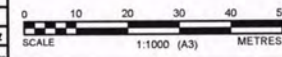


Client: LAND DEVELOPMENT AGENCY

Project: GEOTECHNICAL & PRELIMINARY CONTAMINATION ASSESSMENT

Drawing Title: **SITE LOCALITY & INVESTIGATION LOCATIONS**

Rev	Date	Revision Details	Drn
A	16.07.13	ISSUE	LZ



Location: BLOCK 13 SECTION 28 RIVETT PLACE RIVETT, ACT


Drawn	Date
LZ	16.07.13
Project - Drawing No.	Figure No.
GEDTFYSH09656AA-D01	1
Rev.	
A	



# Appendix A Historical Aerial Photographs


**Preliminary Contamination Assessment,  
Block 13 Section 28, Rivett, ACT**



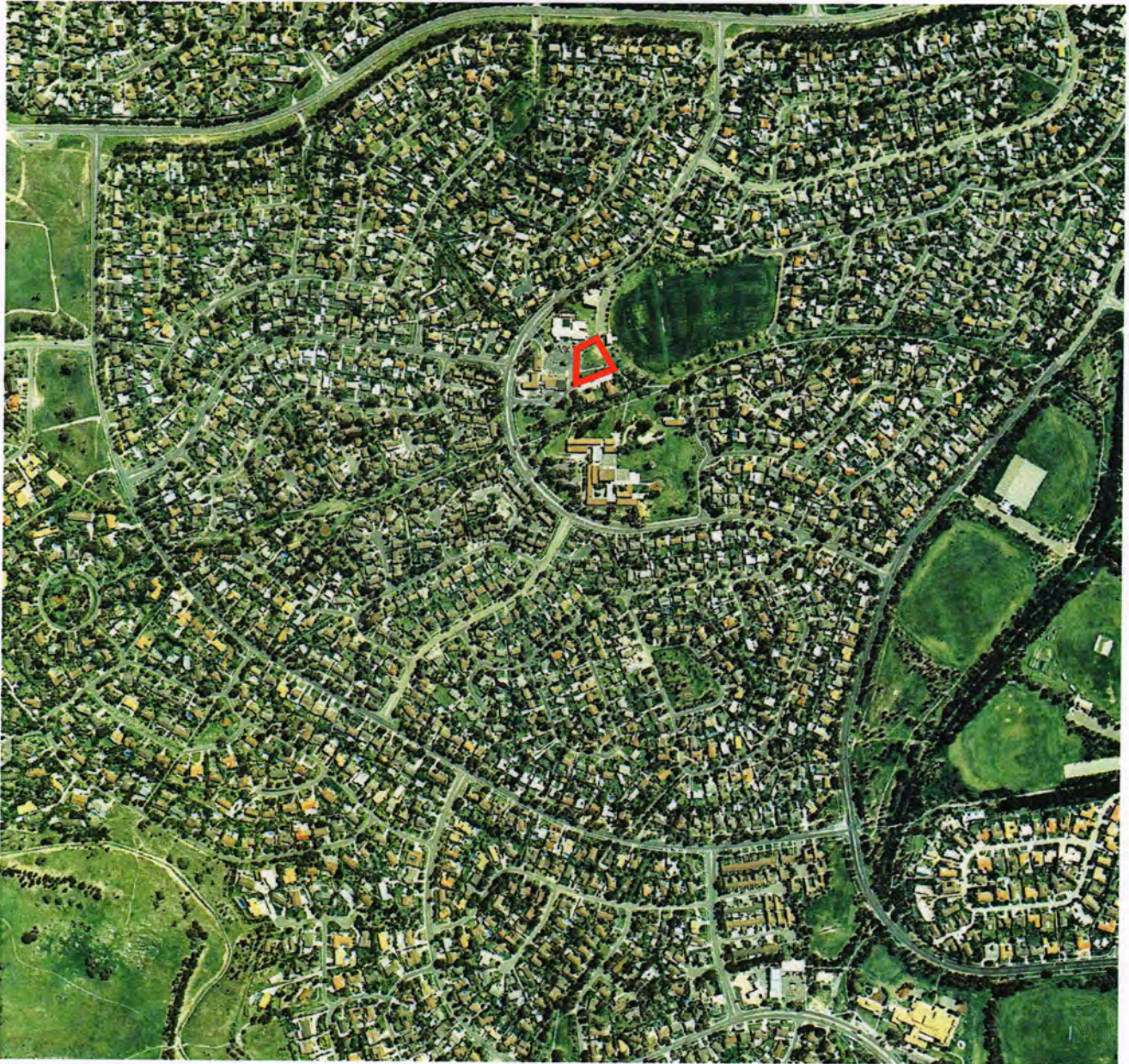
drawn	LZ		client:	LAND DEVELOPMENT AGENCY		
date	16.07.13		project:	GEOTECHNICAL & PRELIMINARY CONTAMINATION ASSESSMENT BLOCK 13 SECTION 28, RIVETT PLACE, RIVETT, ACT		
scale	1:10,000		title:	AERIAL PHOTO - APRIL 1975	job no:	GEOTFYSH09656AA
original size	A4					






drawn	LZ		client:	LAND DEVELOPMENT AGENCY		
date	16.07.13		project:	GEOTECHNICAL & PRELIMINARY CONTAMINATION ASSESSMENT BLOCK 13 SECTION 28, RIVETT PLACE, RIVETT, ACT		
scale	1:10,000		title:	AERIAL PHOTO - MARCH 1985	job no:	GEOTFYSH09656AA
original size	A4					






drawn	LZ		client:	LAND DEVELOPMENT AGENCY		
date	16.07.13		project:	GEOTECHNICAL & PRELIMINARY CONTAMINATION ASSESSMENT BLOCK 13 SECTION 28, RIVETT PLACE, RIVETT, ACT		
scale	1:10,000		title:	AERIAL PHOTO - OCTOBER 1995	job no:	GEOTFYSH09656AA
original size	A4					





drawn	LZ		client:	LAND DEVELOPMENT AGENCY		
date	16.07.13		project:	GEOTECHNICAL & PRELIMINARY CONTAMINATION ASSESSMENT BLOCK 13 SECTION 28, RIVETT PLACE, RIVETT, ACT		
scale	1:10,000		title:	AERIAL PHOTO - MAY 2004	job no:	GEOTFYSH09656AA
original size	A4					



Appendix B  
Territory Plan 2012 – Community Facility  
(CF) Zone

**Preliminary Contamination Assessment,  
Block 13 Section 28, Rivett, ACT**



## CFZ - Community Facility Zone

### Zone Objectives

- a) To facilitate social sustainability and inclusion through providing accessible sites for key government and non-government facilities and services for individuals, families, and communities.
- b) To provide accessible sites for civic life and allow community organisations to meet the needs of the Territory's various forms of community.
- c) To protect these social and community uses from competition from other uses.
- d) To enable the efficient use of land through facilitating the co-location, and multi-use of community facilities, generally near public transport routes and convenience services appropriate to the use.
- e) To encourage adaptable and affordable housing for persons in need of residential support or care.
- f) To safeguard the amenity of surrounding residential areas against unacceptable adverse impacts including from traffic, parking, noise or loss of privacy.

**CFZ – Community Facility Zone Development Table**

<b>EXEMPT DEVELOPMENT</b>	
Development approval is not required. Building approval may be required. On leased land, development must be authorised by a lease.	
Development identified in the Planning and Development Act 2007 as exempt (see sections 133 and 134 of the Act and section 20 and schedule 1 of the Planning and Development Regulation 2008)	
<b>ASSESSABLE DEVELOPMENT</b>	
Development application required. On leased land, development must be authorised by a lease.	
<b>MINIMUM ASSESSMENT TRACK CODE</b>	
Development listed below requires a development application and is assessed in the code track	
<b>Development</b>	
No development identified	
<b>MINIMUM ASSESSMENT TRACK MERIT</b>	
Development listed below requires a development application and is assessed in the merit track, unless specified in schedule 4 of the Planning and Development Act 2007 (as impact track) or specified as prohibited development in a precinct map.	
<b>Development</b>	
ancillary use	minor use
business agency	office
child care centre	outdoor recreation facility
community activity centre	parkland
community theatre	place of worship
consolidation	public agency
cultural facility	religious associated use
demolition	residential care accommodation
development in a location and of a type identified in a precinct map as additional merit track development	retirement village
educational establishment	sign
emergency services facility	subdivision
health facility	supportive housing
hospital	temporary use
indoor recreation facility	varying a lease (where not code track or impact track assessable)
minor road	
<b>MINIMUM ASSESSMENT TRACK IMPACT</b>	
Development listed below requires a development application and is assessed in the impact track	
1. Development that is not: <ul style="list-style-type: none"> <li>a. Exempt code track or merit track development; or</li> <li>b. Prohibited development other than development that is permitted under s137 of the Planning and Development Act 2007.</li> </ul>	
2. Development specified in schedule 4 of the Planning and Development Act 2007 and not listed as a prohibited use in this table.	
3. Development that is authorised by a lease and listed as a prohibited use in this table.	
4. Development declared under section 124 or section 125 of the Planning and Development Act 2007 and not listed as a prohibited development in this table.	
5. Varying a lease to add a use assessable under the impact track.	



<b>PROHIBITED DEVELOPMENT</b>	
Development listed below is prohibited development unless the development is identified elsewhere in this development table as assessable under the code, merit or impact track.	
agriculture	MAJOR UTILITY INSTALLATION
airport	mining industry
animal care facility	mobile home park
animal husbandry	multi-unit housing
aquatic recreation facility	municipal depot
boarding house	nature conservation area
bulk landscape supplies	offensive industry
car park	overnight camping area
caretakers residence	pedestrian plaza
caravan park/camping ground	place of assembly
cemetery	plant and equipment hire establishment
civic administration	plantation forestry
club	playing field
communications facility	produce market
COMMERCIAL ACCOMMODATION USE	public transport facility
corrections facility	railway use
craft workshop	recyclable materials collection
defence installation	recycling facility
development in a location and of a type identified in a precinct map as additional prohibited development	relocatable unit
drink establishment	restaurant
drive-in cinema	sand and gravel extraction
farm tourism	scientific research establishment
financial establishment	serviced apartment
freight transport facility	service station
funeral parlour	SHOP
general industry	single dwelling housing
group or organised camp	special dwelling
habitable suite	stock/sale yard
hazardous industry	store
hazardous waste facility	tourist facility
home business	transport depot
incineration facility	varying a lease to add a use listed as "prohibited development" in this development table
indoor entertainment facility	vehicle sales
industrial trades	veterinary hospital
land fill site	warehouse
land management facility	waste transfer station
light industry	woodlot
liquid fuel depot	zoological facility
major road	
<b>RELEVANT CODE</b>	
Development proposals must comply with the Community Facility Zone Development Code.	

**NOTE ABOUT ANCILLARY, MINOR AND TEMPORARY USE**

Some development that would otherwise be prohibited may be assessed under the merit track if they can be defined as *ancillary, minor or temporary use*. For example, a *car park* alone is prohibited, but could be considered if it is ancillary to a *child care centre* which is an assessable development under the merit track.



# Appendix C ACT EPA Record Search

**Preliminary Contamination Assessment,  
Block 13 Section 28, Rivett, ACT**

File Ref: 97/5030

Coffey Environments Pty Ltd  
16 Mildura Street  
Fyshwick ACT 2609

**RE: CONTAMINATED LAND SEARCH**

Dear

Thank you for your search form request of 24/06/2013 enquiring about:

**Block 2 Section 517 Gordon Tuggeranong**

Records held by the Environment Protection Authority (EPA) for the above block(s) indicate the following:

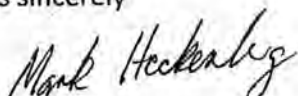
The block is not recorded on the EPA's contaminated sites management database or geographic information system.

The EPA has not issued any environment protection orders under sections 91C (1), 91D (1) or 125 (4) of the *Environment Protection Act 1997* (the Act) over the site and as a result the site is not recorded on the Register of contaminated sites under section 21(A) of the Act.

At present the EPA has no information on contamination of the above block(s). However, this does not absolutely rule out the possibility of contamination and should not be interpreted as a warranty that there is no contamination.

I appreciate that this does not absolutely rule out the existence of contamination of the soils. If you or your clients wish to be completely sure, you, or they, should arrange to conduct independent tests.

Yours sincerely



Mark Heckenberg  
Project Officer  
Environment Protection and Water Regulation

24/06/2013







File Ref: 97/5032

Ms  
Coffey Environments Pty Ltd  
16 Mildura Street  
Fyshwick ACT 2609

**RE: CONTAMINATED LAND SEARCH**

Dear

Thank you for your search form request of 24/06/2013 enquiring about:

**Block 13 Section 28 Rivett Weston Creek**

Records held by the Environment Protection Authority (EPA) for the above block(s) indicate the following:

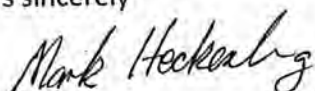
The block is not recorded on the EPA's contaminated sites management database or geographic information system.

The EPA has not issued any environment protection orders under sections 91C (1), 91D (1) or 125 (4) of the *Environment Protection Act 1997* (the Act) over the site and as a result the site is not recorded on the Register of contaminated sites under section 21(A) of the Act.

At present the EPA has no information on contamination of the above block(s). However, this does not absolutely rule out the possibility of contamination and should not be interpreted as a warranty that there is no contamination.

I appreciate that this does not absolutely rule out the existence of contamination of the soils. If you or your clients wish to be completely sure, you, or they, should arrange to conduct independent tests.

Yours sincerely



Mark Heckenberg  
Project Officer  
Environment Protection and Water Regulation

24/06/2013





# Appendix D

## ORS Dangerous Goods Search

**Preliminary Contamination Assessment,  
Block 13 Section 28, Rivett, ACT**





**OFFICE OF REGULATORY SERVICES**  
DEPARTMENT OF JUSTICE & COMMUNITY SAFETY

28 June 2013

Coffey Environments Australia

16 Mildura Street

FYSHWICK ACT 2609

Attention: Teagan Ashworth

Thank you for the application for a records search for Block 2 Section 517 Gordon and Block 13 Section 28 Rivett, Canberra.

I have conducted a search of the Dangerous Goods Database and the Dangerous Substances Register and hold no records for the above site.

(Please note: Under the *Dangerous Goods Act 1975* (1975 to April 2004), tanks of 50,000 litres which contained Diesel were not required to be licenced with WorkCover, only if the capacity was 50,001 litres).

If you have any questions in relation to this matter please do not hesitate in contacting me on 62076353 or email [lisa.curran@act.gov.au](mailto:lisa.curran@act.gov.au).

Regards

A handwritten signature in blue ink, appearing to read 'Lisa Curran'.

Lisa Curran

Administration Officer

Dangerous Substances Licencing

WorkSafe ACT

**WORKSAFE ACT**

LVL 3 CALLAM OFFICES EASTY STREET PHILLIP ACT 2606 |  
GPO BOX 158 CANBERRA ACT 2601 |  
PHONE 6207 3000 | FAX 6205 0336 |  
WORKSAFE@ACT.GOV.AU | WORKSAFE.ACT.GOV.AU

# Appendix E Historical Documents

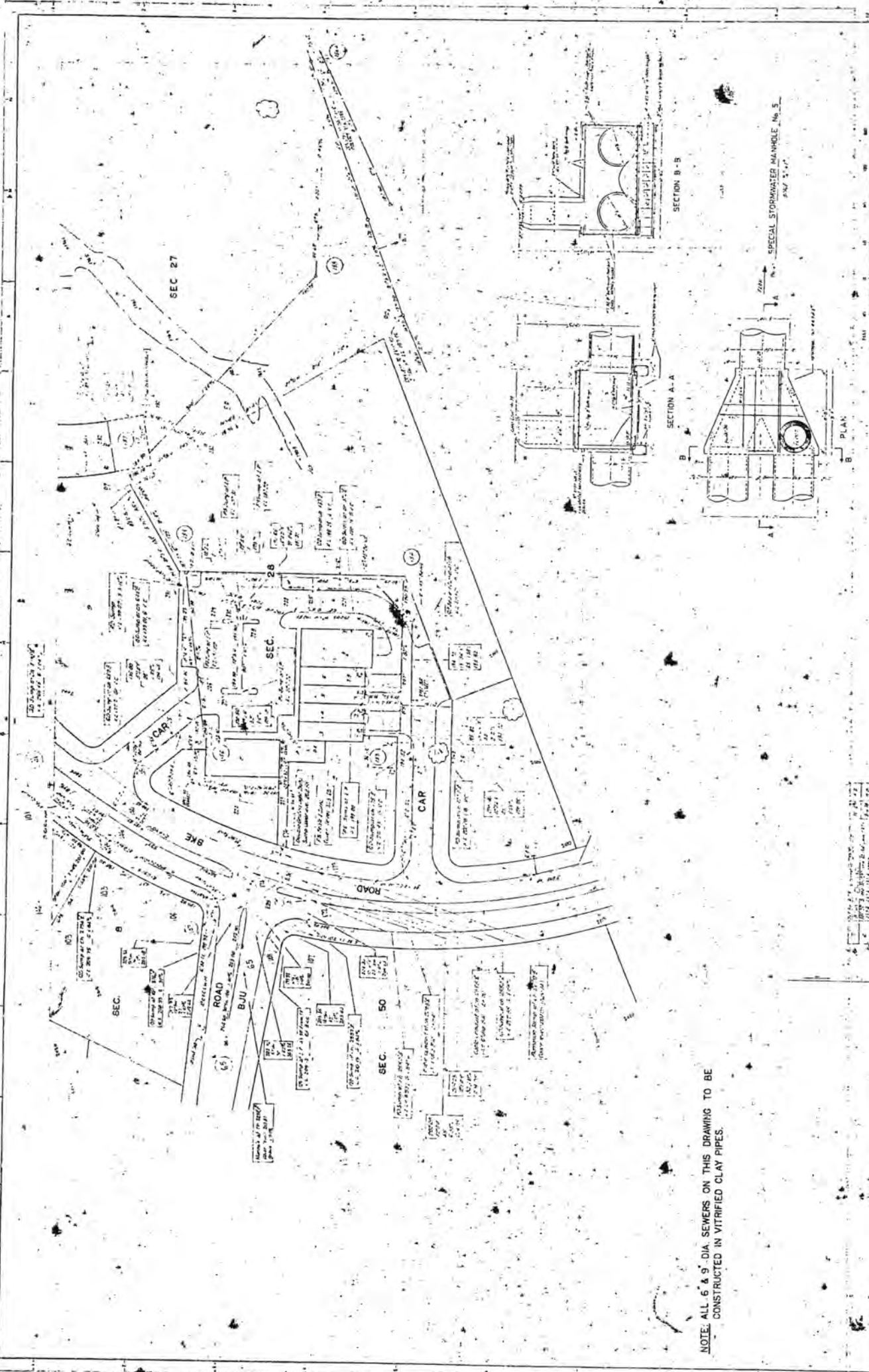
**Preliminary Contamination Assessment,  
Block 13 Section 28, Rivett, ACT**











NOTE: ALL 6 & 9" DIA. SEWERS ON THIS DRAWING TO BE CONSTRUCTED IN VITRIFIED CLAY PIPES.

DATE	1/15/56
BY	J. J. [Signature]
CHECKED BY	[Signature]
SCALE	AS SHOWN
PROJECT NO.	CH69/56 B-7

SECTION A-A  
SECTION B-B  
SPECIAL STORMWATER MANHOLE No. 5  
PLAN

FOR AND ON BEHALF OF  
THE NATIONAL CAPITAL  
DEVELOPMENT COMMISSION

COMMISSIONER OF HIGHWAYS  
DEPARTMENT OF WORKS  
CHINAIA, A.C.I.

NO.	DESCRIPTION	DATE
1	ISSUED FOR TENDERS	1/15/56
2	ISSUED FOR TENDERS	1/15/56
3	ISSUED FOR TENDERS	1/15/56
4	ISSUED FOR TENDERS	1/15/56
5	ISSUED FOR TENDERS	1/15/56

50	51	52
53	54	55
56	57	58

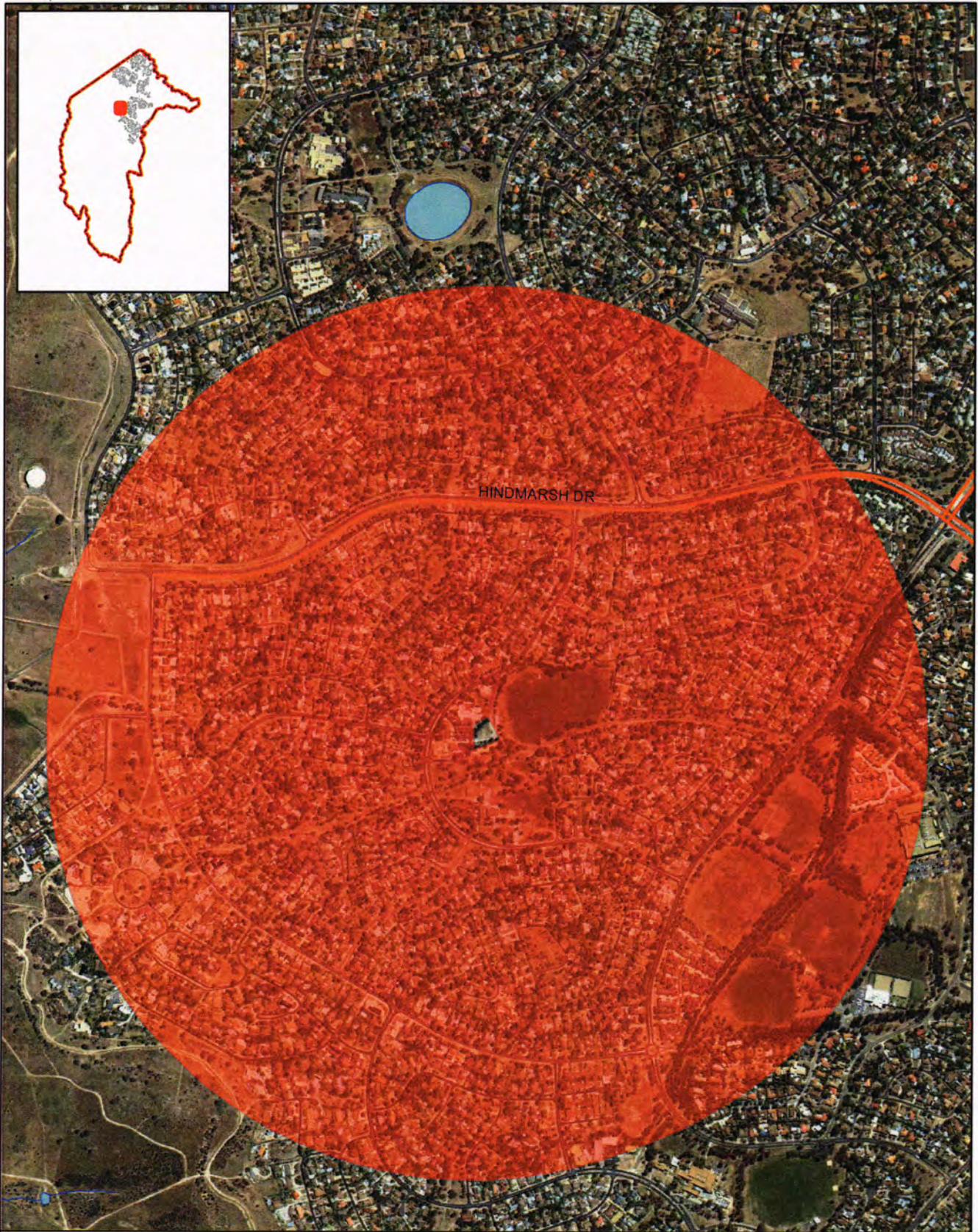
KEY TO ADJOINING SHEETS

# Appendix F

## ACT EPWRD Groundwater Bore Search

**Preliminary Contamination Assessment,  
Block 13 Section 28, Rivett, ACT**





**Groundwater bore search**  
**Site: block 13, section 28 Rivett**

Date: 25 June 2013  
Produced by: Water Regulation  
Source: Environment and Sustainable Development Directorate (ESDD)




Coordinate system: MGA Zone 55  
Datum: GDA 1994

Contact: Contact Water Regulation via Canberra Connect (132281)

Disclaimer: ESDD does not warrant that the data is free from errors.



**Legend**

-  1km buffer of site
-  Groundwater
-  Groundwater and surface water



**ACT**  
Government  
Environment and  
Sustainable Development







**ACT**  
Government

Environment and  
Sustainable Development

Coffey  
Email:

Dear

I refer to your application for a groundwater bore search. There are no privately managed groundwater abstraction bores registered under the *Water Resources Act 2007* within a 1km radial search area of block 13, section 28, Rivett.

Please note that this search does not include investigation and/or monitoring bores associated with possible contaminated sites in the search area. If you require more information please contact Contaminated Sites (Environment Protection Authority) on 132281.

If you have any questions please contact me on (02) 6207 5606 or email [jillian.harrap@act.gov.au](mailto:jillian.harrap@act.gov.au).

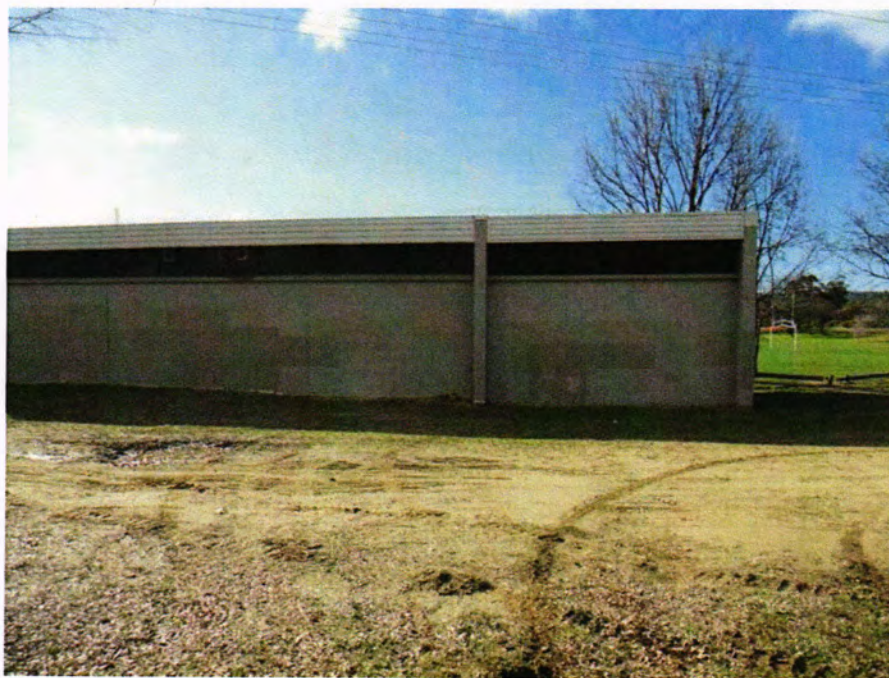
Yours sincerely

Jillian Harrap  
Environment Protection Officer  
Water Regulation  
25/06/2013



# Appendix G Site Photographs

**Preliminary Contamination Assessment,  
Block 13 Section 28, Rivett, ACT**



**Photograph 1:** Unsealed Car trafficking Area and rear of sporting field amenity block  
– Looking east.



**Photograph 2:** Southern view of Site.





**Photograph 3:** South-eastern view of Site taken from NW corner (adjacent Rivett Place).



**Photograph 4:** Western view of tree line toward Respite Centre and Rivett Shops car parking area.

# Appendix H Test Pit Logs

**Preliminary Contamination Assessment,  
Block 13 Section 28, Rivett, ACT**



## Engineering Log - Excavation

Client: **Land Development Agency**

Principal:

Project: **Due Diligence Assessment: Block 13, Section 28, Rivett, ACT**

Test pit location: **Refer to Figure 1**

Excavation No. **TP01**

Sheet 1 of 1

Project No: **GEOTFYSH09656AA**

Date started: **4.7.2013**

Date completed: **4.7.2013**

Logged by: **SB**

Checked by: **CMC/ND**

equipment type and model: 5 Tonne Pit Orientation: Easting: 689310 m R.L. Surface:  
excavation dimensions: 0.7m long 2.5m wide Northing: 6073338 m datum: UTM 55H

excavation information					material substance							
method	penetration	support	water	notes samples, tests, etc	depth RL	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/density index	pocket penetrometer	structure and additional observations
1	2	3									100 200 300 400	
W		N						FILL: <b>Clayey SAND</b> , fine to coarse grained, brown, medium plasticity clay	D	S		FILL
		None Encountered		TP1-1			Cl	<b>CLAY</b> , medium plasticity, black with some white and grey sand, with some fine to coarse grained sand	<Wp	VSt/H		RESIDUAL PID = 0.0
				TP1-2	0.5							PID = 0.0
				DS				<b>SANDSTONE</b> , very low to low strength	D	H		EXTREMELY TO HIGHLY WEATHERED ROCK
					1.0			Test pit TP01 terminated at 0.8m				Test Pit terminated on Very Slow progress
					1.5							

Sketch

<b>method</b> N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	<b>support</b> S shoring N nil  <b>penetration</b> 1 2 3 4 no resistance ranging to refusal  <b>water</b> ▽ water level on date shown ► water inflow ◄ water outflow	<b>notes, samples, tests</b> U <sub>50</sub> undisturbed sample 50mm diameter U <sub>63</sub> undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	<b>classification symbols and soil description</b> based on unified classification system  <b>moisture</b> D dry M moist W wet W <sub>p</sub> plastic limit W <sub>L</sub> liquid limit	<b>consistency/density index</b> VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
---	--	---	---	---

TESTPIT GEOTFYSH09656AA.GPJ COFFEY.GDT 18.7.13





Form GEO 5.2 Issue 3 Rev.2

**Engineering Log - Excavation**





Excavation No. **TP02**  
 Sheet 1 of 1  
 Project No: **GEOTFYSH09656AA**  
 Date started: **4.7.2013**  
 Date completed: **4.7.2013**  
 Logged by: **SB**  
 Checked by: **CMC/ND**

Client: **Land Development Agency**  
 Principal:  
 Project: **Due Diligence Assessment: Block 13, Section 28, Rivett, ACT**  
 Test pit location: **Refer to Figure 1**

equipment type and model: 5 Tonne Pit Orientation: Easting: 689283 m R.L. Surface:  
 excavation dimensions: 0.7m long 2.5m wide Northing: 6073338 m datum: UTM 55H

excavation information				material substance							
method	penetration	support	notes	depth	graphic log	classification	material	moisture	consistency/density	pocket penetrometer	structure and additional observations
1 2 3			samples, tests, etc	RL metres		symbol	soil type: plasticity or particle characteristics, colour, secondary and minor components.	condition	index	kPa	
N		N	TP2-1				FILL: Clayey SAND, fine to medium grained, pale black, medium plasticity clay	D	L		FILL
		None Encountered	TP2-2			SW	SAND, fine to medium grained, pale grey, with some medium plasticity clay	M	MD		PID = 0.0 PID = 0.0
			DS	0.5		CH	Sandy CLAY, medium to high plasticity, red/brown/orange, fine to coarse grained sand	=Wp	VSt		RESIDUAL SOIL
						SC	Clayey SAND, fine to coarse grained, grey/brown, medium plasticity clay	D	VD		Tree root observed at 0.7m EXTREMELY WEATHERED ROCK
				1.0			Test pit TP02 terminated at 0.9m				Test Pit terminated on Very Slow progress
				1.5							

Sketch

<b>method</b> N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	<b>support</b> S shoring N nil  <b>penetration</b> 1 2 3 4  no resistance ranging to refusal <b>water</b>  water level on date shown  water inflow  water outflow	<b>notes, samples, tests</b> U <sub>50</sub> undisturbed sample 50mm diameter U <sub>63</sub> undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	<b>classification symbols and soil description</b> based on unified classification system  <b>moisture</b> D dry M moist W wet W <sub>p</sub> plastic limit W <sub>L</sub> liquid limit	<b>consistency/density index</b> VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
---	--	---	---	---



## Engineering Log - Excavation

Client: **Land Development Agency**

Principal:

Project: **Due Diligence Assessment: Block 13, Section 28, Rivett, ACT**

Test pit location: **Refer to Figure 1**

Excavation No. **TP03**

Sheet 1 of 1

Project No: **GEOTFYSH09656AA**

Date started: **4.7.2013**

Date completed: **4.7.2013**

Logged by: **SB**

Checked by: **CMC/ND**

equipment type and model: 5 Tonne Pit Orientation: Easting: 689270 m R.L. Surface:  
excavation dimensions: 0.7m long 2.5m wide Northing: 6073317 m datum: UTM 55H

excavation information				material substance								
method	penetration	support	water	notes samples, tests, etc	depth RL	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/density index	pocket penetrometer	structure and additional observations
1	2	3									100 200 300 400	
		N						FILL: <b>Clayey SAND</b> , fine to coarse grained, black, medium plasticity clay, with some foreign material	M	L		FILL
		None Encountered										
				TP3-1			CH	<b>CLAY</b> , high plasticity, red/brown, some fine grained sand	<Wp	St		RESIDUAL SOIL PID = 0.0
				TP3-2	0.5		SC	<b>Clayey SAND</b> , fine to medium grained, grey/brown, medium plasticity clay	D	D/VD		EXTREMELY WEATHERED ROCK
								Test pit TP03 terminated at 0.8m				Tree root observed at 0.8m Test Pit terminated on Very Slow progress
					1.0							
					1.5							

Sketch

<b>method</b> N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	<b>support</b> S shoring N nil  <b>penetration</b> 1 2 3 4 no resistance ranging to refusal  <b>water</b> water level on date shown water inflow water outflow	<b>notes, samples, tests</b> U <sub>50</sub> undisturbed sample 50mm diameter U <sub>63</sub> undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	<b>classification symbols and soil description</b> based on unified classification system  <b>moisture</b> D dry M moist W wet W <sub>p</sub> plastic limit W <sub>L</sub> liquid limit	<b>consistency/density index</b> VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
---	--	---	---	---



## Engineering Log - Excavation

Client: **Land Development Agency**

Principal:

Project: **Due Diligence Assessment: Block 13, Section 28, Rivett, ACT**

Test pit location: **Refer to Figure 1**

Excavation No. **TP04**

Sheet 1 of 1

Project No: **GEOTFYSH09656AA**

Date started: **4.7.2013**

Date completed: **4.7.2013**

Logged by: **SB**

Checked by: **CMC/ND**

equipment type and model: 5 Tonne Pit Orientation: Easting: 689297 m R.L. Surface:  
excavation dimensions: 0.7m long 2.5m wide Northing: 6073327 m datum: UTM 55H

excavation information				material substance								
method	penetration	support	water	notes samples, tests, etc	depth RL metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
1	2	3						soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
N								<b>FILL: Clayey SAND</b> , fin to coarse grained, brown, medium plasticity, with some foreign material	D	L		FILL
				TP4-1			CL	<b>CLAY</b> , low to medium plasticity, black, with some fine grained sand, gravel and charcoal	<Wp	S		PID = 0.0
				TP4-2	0.5		CH	<b>Sandy CLAY</b> , medium to high plasticity, red/brown, fine to medium grained sand	=Wp	St		RESIDUAL SOIL
				Bs								
					1.0		SW	<b>Gravelly SAND</b> , fine to coarse grained, brown/orange/grey/red, fine to coarse grained, angular to subangular gravel	D/M	D		EXTREMELY WEATHERED ROCK PID = 0.0
								Test pit TP04 terminated at 1.3m				Test Pit terminated on Very Slow progress
					1.5							

Sketch

<b>method</b> N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	<b>support</b> S shoring N nil  <b>penetration</b> 1 2 3 4 no resistance ranging to refusal  <b>water</b> water level on date shown water inflow water outflow	<b>notes, samples, tests</b> U <sub>50</sub> undisturbed sample 50mm diameter U <sub>63</sub> undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	<b>classification symbols and soil description</b> based on unified classification system  <b>moisture</b> D dry M moist W wet W <sub>p</sub> plastic limit W <sub>L</sub> liquid limit	<b>consistency/density index</b> VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
---	--	---	---	---



# Engineering Log - Excavation

Client: **Land Development Agency**

Principal:

Project: **Due Diligence Assessment: Block 13, Section 28, Rivett, ACT**

Test pit location: **Refer to Figure 1**

Excavation No. **TP05**

Sheet 1 of 1

Project No: **GEOTFYSH09656AA**

Date started: **4.7.2013**

Date completed: **4.7.2013**

Logged by: **SB**

Checked by: **CMC/ND**

equipment type and model: 5 Tonne Pit Orientation: Easting: 689310 m R.L. Surface:  
excavation dimensions: 0.7m long 2.5m wide Northing: 6073326 m datum: UTM 55H

excavation information				material substance								
method	penetration			notes samples, tests, etc	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
	1	2	3									
N				TP5-1 None Encountered	0.5	[diagonal hatching]	CH	CLAY, high plasticity, red/brown, some fine grained sand	M	L		FILL
				TP5-1	0.5	[diagonal hatching]	SC	Clayey SAND, fine to medium grained, grey/brown, medium plasticity clay, with some fine to coarse grained gravel	<Wp	St		RESIDUAL PID = 0.0
					0.5	[diagonal hatching]			D	D/D/D		EXTREMELY WEATHERED ROCK
					1.0			Test pit TP05 terminated at 0.8m				Tree root observed at 0.6m PID = 0.0
					1.5							Test Pit terminated on Very Slow progress

Sketch

<b>method</b> N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	<b>support</b> S shoring N nil  <b>penetration</b> 1 2 3 4 no resistance ranging to refusal  <b>water</b> water level on date shown water inflow water outflow	<b>notes, samples, tests</b> U <sub>50</sub> undisturbed sample 50mm diameter U <sub>63</sub> undisturbed sample 63mm diameter D disturbed sample V vane shear (kPa) Bs bulk sample E environmental sample R refusal	<b>classification symbols and soil description</b> based on unified classification system  <b>moisture</b> D dry M moist W wet W <sub>p</sub> plastic limit W <sub>L</sub> liquid limit	<b>consistency/density index</b> VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
---	--	---	---	---

# Appendix I Laboratory Documentation

**Preliminary Contamination Assessment,  
Block 13 Section 28, Rivett, ACT**





**Liability & Risk Management Consulting**

LRM Global Pty Ltd  
65 Stubbs Street  
Kensington VIC 3031

Fax: (03) 9371 3499  
Email: enquiries@lrmglobal.com.au  
Web: www.lrmglobal.com.au  
Telephone: (03) 9371 3400  
ABN: 34 116 540 277

Eurofins / mgt Environmental Consulting  
3, Kingston Town Close  
Oakleigh Victoria 3166

**Client Ref:** 385457

**Job Number:** 9950.000

**Batch Number:** B7652

**Received Date:** July 11, 2013

**Analysed Date:** July 15, 2013

**No of Samples:** 6

Dear Tammy Lakeland,

This report presents the analytical results of samples forwarded by Eurofins / mgt Environmental Consulting for asbestos analysis.

**Methodology:**

The samples were examined under a Stereo Microscope and selected fibres were analysed by Polarized Light Microscopy in conjunction with Dispersion Staining Method. (**LRM Global ID Method 1**)

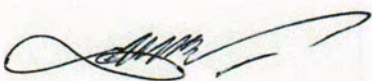
**Analytical Results:**

<b>Sample No.</b>	<b>Sample Description</b>	<b>Result</b>
TP1-1-JL06975	The sample consisted of plant matter and soils Sample Dimensions: 5.0cm X 3.0cm X 2.0cm	No Asbestos Detected Organic Fibre Detected
TP2-1-JL06976	The sample consisted of plant matter and soils Sample Dimensions: 5.0cm X 3.0cm X 2.0cm	No Asbestos Detected Organic Fibre Detected
TP3-1-JL06977	The sample consisted of plant matter and soils Sample Dimensions: 5.0cm X 3.0cm X 2.0cm	No Asbestos Detected Organic Fibre Detected
TP3-2-JL06978	The sample consisted of plant matter and soils Sample Dimensions: 5.0cm X 3.0cm X 2.0cm	No Asbestos Detected Organic Fibre Detected
TP4-1-JL06979	The sample consisted of plant matter and soils Sample Dimensions: 5.0cm X 3.0cm X 2.0cm	No Asbestos Detected Organic Fibre Detected
TP5-1-JL06980	The sample consisted of plant matter and soils Sample Dimensions: 5.0cm X 3.0cm X 2.0cm	No Asbestos Detected Organic Fibre Detected

---



Approved Identifier  
Karu Jayasundara



Report Issued by  
Karu Jayasundara



**WORLD RECOGNISED  
ACCREDITATION**  
Accreditation No: 15684

This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.



Coffey Environments Pty Ltd ACT  
16 Mildura Street  
Fyshwick  
ACT 2609

Attention:

Report **385457-S**  
Client Reference GEOTFYSH09656AA  
Received Date Jul 09, 2013



### Certificate of Analysis

NATA Accredited  
Accreditation Number 1261  
Site Number 1254

Accredited for compliance with ISO/IEC 17025.  
The results of the tests, calibrations and/or  
measurements included in this document are traceable  
to Australian national standards.

Client Sample ID			TP1-1	TP2-1	TP3-1	TP3-2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			M13-JI06975	M13-JI06976	M13-JI06977	M13-JI06978
Date Sampled			Jul 05, 2013	Jul 05, 2013	Jul 05, 2013	Jul 05, 2013
Test/Reference	LOR	Unit				
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>						
TRH C6-C9	20	mg/kg	< 20	-	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	-	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	-	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	-	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	-	< 50	< 50
<b>BTEX</b>						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Xylenes - Total	0.3	mg/kg	< 0.3	-	< 0.3	< 0.3
Fluorobenzene (surr.)	1	%	114	-	79	98
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
Naphthalene <sup>N02</sup>	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	-	< 20	< 20
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	20	mg/kg	< 20	-	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	-	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	50	mg/kg	< 50	-	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	-	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	-	< 100	< 100
<b>Polycyclic Aromatic Hydrocarbons</b>						
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(b&j)fluoranthene <sup>N07</sup>	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5



Client Sample ID			TP1-1	TP2-1	TP3-1	TP3-2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			M13-JI06975	M13-JI06976	M13-JI06977	M13-JI06978
Date Sampled			Jul 05, 2013	Jul 05, 2013	Jul 05, 2013	Jul 05, 2013
Test/Reference	LOR	Unit				
<b>Polycyclic Aromatic Hydrocarbons</b>						
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	95	-	99	94
p-Terphenyl-d14 (surr.)	1	%	85	-	81	76
Total PAH	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(a)pyrene TEQ	0.5	mg/kg	0.6	-	0.6	0.6
<b>Organochlorine Pesticides</b>						
4,4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
4,4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
4,4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Chlordane	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Toxaphene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	93	-	113	98
Tetrachloro-m-xylene (surr.)	1	%	108	-	143	124
<b>Organophosphorous Pesticides</b>						
Bolstar	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Methyl azinphos	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Naled	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Phorate	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2



Client Sample ID			TP1-1	TP2-1	TP3-1	TP3-2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins   mgt Sample No.			M13-JI06975	M13-JI06976	M13-JI06977	M13-JI06978
Date Sampled			Jul 05, 2013	Jul 05, 2013	Jul 05, 2013	Jul 05, 2013
Test/Reference	LOR	Unit				
<b>Organophosphorous Pesticides</b>						
Ronnel	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	102	-	95	86
<b>Heavy Metals</b>						
Arsenic	2	mg/kg	4.0	3.6	3.7	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	12	11	17	12
Copper	5	mg/kg	< 5	< 5	< 5	< 5
Lead	5	mg/kg	10	11	12	8.3
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	7.8	11	9.5	11
% Moisture	0.1	%	10	11	12	12
Asbestos			see attached	see attached	see attached	see attached

Client Sample ID			TP4-1	TP5-1
Sample Matrix			Soil	Soil
Eurofins   mgt Sample No.			M13-JI06979	M13-JI06980
Date Sampled			Jul 05, 2013	Jul 05, 2013
Test/Reference	LOR	Unit		
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				
TRH C6-C9	20	mg/kg	-	< 20
TRH C10-C14	20	mg/kg	-	< 20
TRH C15-C28	50	mg/kg	-	< 50
TRH C29-C36	50	mg/kg	-	< 50
TRH C10-36 (Total)	50	mg/kg	-	< 50
<b>BTEX</b>				
Benzene	0.1	mg/kg	-	< 0.1
Toluene	0.1	mg/kg	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1
o-Xylene	0.1	mg/kg	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2
Xylenes - Total	0.3	mg/kg	-	< 0.3
Fluorobenzene (surr.)	1	%	-	110
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				
Naphthalene <sup>N02</sup>	0.5	mg/kg	-	< 0.5
TRH C6-C10	20	mg/kg	-	< 20
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	20	mg/kg	-	< 20
TRH >C10-C16	50	mg/kg	-	< 50
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	50	mg/kg	-	< 50
TRH >C16-C34	100	mg/kg	-	< 100
TRH >C34-C40	100	mg/kg	-	< 100



Client Sample ID			TP4-1	TP5-1
Sample Matrix			Soil	Soil
Eurofins   mgt Sample No.			M13-JI06979	M13-JI06980
Date Sampled			Jul 05, 2013	Jul 05, 2013
Test/Reference	LOR	Unit		
<b>Polycyclic Aromatic Hydrocarbons</b>				
Acenaphthene	0.5	mg/kg	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	< 0.5
Anthracene	0.5	mg/kg	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5
Benzo(b&j)fluoranthene <sup>N07</sup>	0.5	mg/kg	-	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5
Chrysene	0.5	mg/kg	-	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	-	< 0.5
Fluoranthene	0.5	mg/kg	-	< 0.5
Fluorene	0.5	mg/kg	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5
Naphthalene	0.5	mg/kg	-	< 0.5
Phenanthrene	0.5	mg/kg	-	< 0.5
Pyrene	0.5	mg/kg	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	105
p-Terphenyl-d14 (surr.)	1	%	-	85
Total PAH	0.5	mg/kg	-	< 0.5
Benzo(a)pyrene TEQ	0.5	mg/kg	-	0.6
<b>Organochlorine Pesticides</b>				
4.4'-DDD	0.05	mg/kg	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	< 0.05
a-BHC	0.05	mg/kg	-	< 0.05
Aldrin	0.05	mg/kg	-	< 0.05
b-BHC	0.05	mg/kg	-	< 0.05
Chlordane	0.1	mg/kg	-	< 0.1
d-BHC	0.05	mg/kg	-	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05
Endrin	0.05	mg/kg	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05
Methoxychlor	0.05	mg/kg	-	< 0.05
Toxaphene	0.1	mg/kg	-	< 0.1
Dibutylchloroendate (surr.)	1	%	-	99
Tetrachloro-m-xylene (surr.)	1	%	-	126
<b>Organophosphorous Pesticides</b>				
Bolstar	0.2	mg/kg	-	< 0.2
Chlorpyrifos	0.2	mg/kg	-	< 0.2
Demeton-O	0.2	mg/kg	-	< 0.2
Diazinon	0.2	mg/kg	-	< 0.2



Client Sample ID			TP4-1	TP5-1
Sample Matrix			Soil	Soil
Eurofins   mgt Sample No.			M13-JI06979	M13-JI06980
Date Sampled			Jul 05, 2013	Jul 05, 2013
Test/Reference	LOR	Unit		
<b>Organophosphorous Pesticides</b>				
Diazinon	0.2	mg/kg	-	< 0.2
Dichlorvos	0.2	mg/kg	-	< 0.2
Disulfoton	0.2	mg/kg	-	< 0.2
Ethion	0.2	mg/kg	-	< 0.2
Ethoprop	0.2	mg/kg	-	< 0.2
Fenitrothion	0.2	mg/kg	-	< 0.2
Fensulfothion	0.2	mg/kg	-	< 0.2
Fenthion	0.2	mg/kg	-	< 0.2
Merphos	0.2	mg/kg	-	< 0.2
Methyl azinphos	0.2	mg/kg	-	< 0.2
Methyl parathion	0.2	mg/kg	-	< 0.2
Mevinphos	0.2	mg/kg	-	< 0.2
Naled	0.5	mg/kg	-	< 0.5
Phorate	0.2	mg/kg	-	< 0.2
Ronnel	0.2	mg/kg	-	< 0.2
Tokuthion	0.2	mg/kg	-	< 0.2
Trichloronate	0.2	mg/kg	-	< 0.2
Triphenylphosphate (surr.)	1	%	-	103
<b>Heavy Metals</b>				
Arsenic	2	mg/kg	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4
Chromium	5	mg/kg	9.7	10
Copper	5	mg/kg	< 5	< 5
Lead	5	mg/kg	7.7	7.9
Mercury	0.1	mg/kg	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	6.2
Zinc	5	mg/kg	14	22
<b>% Moisture</b>				
% Moisture	0.1	%	12	13
<b>Asbestos</b>				
Asbestos			see attached	see attached

**Sample History**

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

Description	Testing Site	Extracted	Holding Time
<b>Eurofins   mgt Suite 10</b>			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: TRH C6-C36 - MGT 100A	Melbourne	Jul 10, 2013	14 Day
BTEX - Method: USEPA 8260 - MGT 350A Monocyclic Aromatic Hydrocarbons and MGT 100A	Melbourne	Jul 10, 2013	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LM-LTM-ORG2010	Melbourne	Jul 10, 2013	14 Day
Polycyclic Aromatic Hydrocarbons - Method: USEPA 8270 Polycyclic Aromatic Hydrocarbons	Melbourne	Jul 10, 2013	14 Day
Organochlorine Pesticides - Method: USEPA 8081 Organochlorine Pesticides	Melbourne	Jul 10, 2013	14 Day
Organophosphorous Pesticides - Method: USEPA 8141 Organophosphorus Pesticides	Melbourne	Jul 10, 2013	14 Day
Metals M8 - Method: USEPA 6010/6020 Heavy Metals & USEPA 7470/71 Mercury	Melbourne	Jul 10, 2013	28 Day
% Moisture - Method: Method 102 - ANZECC - % Moisture	Melbourne	Jul 10, 2013	14 Day



**Company Name:** Coffey Environments Pty Ltd ACT  
**Address:** 16 Mildura Street  
 Fyshwick  
 ACT 2609  
**Client Job No.:** GEOTFYSH09656AA

**Order No.:**  
**Report #:** 385457  
**Phone:** +61 2 6260 7288  
**Fax:** +61 2 6260 7211

**Received:** Jul 9, 2013 9:04 AM  
**Due:** Jul 16, 2013  
**Priority:** 5 Day  
**Contact Name:** Nick Davison

Eurofins | mgt Client Manager: Tammy Lakeland

Sample Detail					% Moisture	Asbestos	HOLD	Metals M8	Eurofins   mgt Suite 10
<b>Laboratory where analysis is conducted</b>									
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>					X		X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>									
<b>Brisbane Laboratory - NATA Site # 20794</b>									
<b>External Laboratory</b>						X			
Sample ID	Sample Date	Sampling Time	Matrix	LAB ID					
TP1-1	Jul 05, 2013		Soil	M13-JI06975	X	X			X
TP2-1	Jul 05, 2013		Soil	M13-JI06976	X	X		X	
TP3-1	Jul 05, 2013		Soil	M13-JI06977	X	X			X
TP3-2	Jul 05, 2013		Soil	M13-JI06978	X	X			X
TP4-1	Jul 05, 2013		Soil	M13-JI06979	X	X		X	
TP5-1	Jul 05, 2013		Soil	M13-JI06980	X	X			X
TP1-2	Jul 05, 2013		Soil	M13-JI06981			X		
TP2-2	Jul 05, 2013		Soil	M13-JI06982			X		
TP3-3	Jul 05, 2013		Soil	M13-JI06983			X		
TP4-2	Jul 05, 2013		Soil	M13-JI06984			X		

<b>Company Name:</b>	Coffey Environments Pty Ltd ACT	<b>Order No.:</b>		<b>Received:</b>	Jul 9, 2013 9:04 AM
<b>Address:</b>	16 Mildura Street Fyshwick ACT 2609	<b>Report #:</b>	385457	<b>Due:</b>	Jul 16, 2013
<b>Client Job No.:</b>	GEOTFYSH09656AA	<b>Phone:</b>	+61 2 6260 7288	<b>Priority:</b>	5 Day
		<b>Fax:</b>	+61 2 6260 7211	<b>Contact Name:</b>	Nick Davison

**Eurofins | mgt Client Manager: Tammy Lakeland**

Sample Detail				% Moisture	Asbestos	HOLD	Metals M8	Eurofins   mgt Suite 10
<b>Laboratory where analysis is conducted</b>								
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>				X		X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>								
<b>Brisbane Laboratory - NATA Site # 20794</b>								
<b>External Laboratory</b>					X			
TP5-2	Jul 05, 2013		Soil			X		
			M13-JI06985					



**Eurofins | mgt Internal Quality Control Review and Glossary**
**General**

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

**Holding Times**

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

**\*\*NOTE:** pH duplicates are reported as a range NOT as RPD

**UNITS**

**mg/kg:** milligrams per Kilogram

**ug/l:** micrograms per litre

**ppb:** Parts per billion

**org/100ml:** Organisms per 100 millilitres

**MPN/100mL:** Most Probable Number of organisms per 100 millilitres

**mg/l:** milligrams per litre

**ppm:** Parts per million

**%:** Percentage

**NTU:** Units

**TERMS**

<b>Dry</b>	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
<b>LOR</b>	Limit of Reporting
<b>SPIKE</b>	Addition of the analyte to the sample and reported as percentage recovery.
<b>RPD</b>	Relative Percent Difference between two Duplicate pieces of analysis.
<b>LCS</b>	Laboratory Control Sample - reported as percent recovery
<b>CRM</b>	Certified Reference Material - reported as percent recovery
<b>Method Blank</b>	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
<b>Surr - Surrogate</b>	The addition of a like compound to the analyte target and reported as percentage recovery.
<b>Duplicate</b>	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
<b>Batch Duplicate</b>	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
<b>Batch SPIKE</b>	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
<b>USEPA</b>	United States Environment Protection Authority
<b>APHA</b>	American Public Health Association
<b>ASLP</b>	Australian Standard Leaching Procedure (AS4439.3)
<b>TCLP</b>	Toxicity Characteristic Leaching Procedure
<b>COC</b>	Chain of Custody
<b>SRA</b>	Sample Receipt Advice
<b>CP</b>	Client Parent - QC was performed on samples pertaining to this report
<b>NCP</b>	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within

**QC - ACCEPTANCE CRITERIA**

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

**QC DATA GENERAL COMMENTS**

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data.



Test	Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code
<b>Method Blank</b>					
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions TRH C6-C36 - MGT 100A</b>					
TRH C6-C9	mg/kg	< 20	20	Pass	
TRH C10-C14	mg/kg	< 20	20	Pass	
TRH C15-C28	mg/kg	< 50	50	Pass	
TRH C29-C36	mg/kg	< 50	50	Pass	
<b>Method Blank</b>					
<b>BTEX USEPA 8260 - MGT 350A Monocyclic Aromatic Hydrocarbons and MGT 100A</b>					
Benzene	mg/kg	< 0.1	0.1	Pass	
Toluene	mg/kg	< 0.1	0.1	Pass	
Ethylbenzene	mg/kg	< 0.1	0.1	Pass	
o-Xylene	mg/kg	< 0.1	0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2	0.2	Pass	
Xylenes - Total	mg/kg	< 0.3	0.3	Pass	
<b>Method Blank</b>					
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions LM-LTM-ORG2010</b>					
Naphthalene	mg/kg	< 0.5	0.5	Pass	
TRH C6-C10	mg/kg	< 20	20	Pass	
TRH >C10-C16	mg/kg	< 50	50	Pass	
TRH >C16-C34	mg/kg	< 100	100	Pass	
TRH >C34-C40	mg/kg	< 100	100	Pass	
<b>Method Blank</b>					
<b>Polycyclic Aromatic Hydrocarbons USEPA 8270 Polycyclic Aromatic Hydrocarbons</b>					
Acenaphthene	mg/kg	< 0.5	0.5	Pass	
Acenaphthylene	mg/kg	< 0.5	0.5	Pass	
Anthracene	mg/kg	< 0.5	0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5	0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5	0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5	0.5	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5	0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5	0.5	Pass	
Chrysene	mg/kg	< 0.5	0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5	0.5	Pass	
Fluoranthene	mg/kg	< 0.5	0.5	Pass	
Fluorene	mg/kg	< 0.5	0.5	Pass	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5	0.5	Pass	
Naphthalene	mg/kg	< 0.5	0.5	Pass	
Phenanthrene	mg/kg	< 0.5	0.5	Pass	
Pyrene	mg/kg	< 0.5	0.5	Pass	
<b>Method Blank</b>					
<b>Organochlorine Pesticides USEPA 8081 Organochlorine Pesticides</b>					
4,4'-DDD	mg/kg	< 0.05	0.05	Pass	
4,4'-DDE	mg/kg	< 0.05	0.05	Pass	
4,4'-DDT	mg/kg	< 0.05	0.05	Pass	
a-BHC	mg/kg	< 0.05	0.05	Pass	
Aldrin	mg/kg	< 0.05	0.05	Pass	
b-BHC	mg/kg	< 0.05	0.05	Pass	
Chlordane	mg/kg	< 0.1	0.1	Pass	
d-BHC	mg/kg	< 0.05	0.05	Pass	
Dieldrin	mg/kg	< 0.05	0.05	Pass	
Endosulfan I	mg/kg	< 0.05	0.05	Pass	



Test	Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan II	mg/kg	< 0.05	0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05	0.05	Pass	
Endrin	mg/kg	< 0.05	0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05	0.05	Pass	
Endrin ketone	mg/kg	< 0.05	0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05	0.05	Pass	
Heptachlor	mg/kg	< 0.05	0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05	0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05	0.05	Pass	
Methoxychlor	mg/kg	< 0.05	0.05	Pass	
Toxaphene	mg/kg	< 0.1	0.1	Pass	
<b>Method Blank</b>					
<b>Organophosphorous Pesticides USEPA 8141 Organophosphorus Pesticides</b>					
Bolstar	mg/kg	< 0.2	0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2	0.2	Pass	
Demeton-O	mg/kg	< 0.2	0.2	Pass	
Diazinon	mg/kg	< 0.2	0.2	Pass	
Dichlorvos	mg/kg	< 0.2	0.2	Pass	
Disulfoton	mg/kg	< 0.2	0.2	Pass	
Ethion	mg/kg	< 0.2	0.2	Pass	
Ethoprop	mg/kg	< 0.2	0.2	Pass	
Fenitrothion	mg/kg	< 0.2	0.2	Pass	
Fensulfothion	mg/kg	< 0.2	0.2	Pass	
Fenthion	mg/kg	< 0.2	0.2	Pass	
Merphos	mg/kg	< 0.2	0.2	Pass	
Methyl azinphos	mg/kg	< 0.2	0.2	Pass	
Methyl parathion	mg/kg	< 0.2	0.2	Pass	
Mevinphos	mg/kg	< 0.2	0.2	Pass	
Naled	mg/kg	< 0.5	0.5	Pass	
Phorate	mg/kg	< 0.2	0.2	Pass	
Ronnel	mg/kg	< 0.2	0.2	Pass	
Tokuthion	mg/kg	< 0.2	0.2	Pass	
Trichloronate	mg/kg	< 0.2	0.2	Pass	
<b>Method Blank</b>					
<b>Metals M8 USEPA 6010/6020 Heavy Metals &amp; USEPA 7470/71 Mercury</b>					
Arsenic	mg/kg	< 2	2	Pass	
Cadmium	mg/kg	< 0.4	0.4	Pass	
Chromium	mg/kg	< 5	5	Pass	
Copper	mg/kg	< 5	5	Pass	
Lead	mg/kg	< 5	5	Pass	
Mercury	mg/kg	< 0.1	0.1	Pass	
Nickel	mg/kg	< 5	5	Pass	
Zinc	mg/kg	< 5	5	Pass	
<b>LCS - % Recovery</b>					
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions TRH C6-C36 - MGT 100A</b>					
TRH C6-C9	%	104	70-130	Pass	
TRH C10-C14	%	100	70-130	Pass	
<b>LCS - % Recovery</b>					
<b>BTEX USEPA 8260 - MGT 350A Monocyclic Aromatic Hydrocarbons and MGT 100A</b>					
Benzene	%	107	70-130	Pass	
Toluene	%	99	70-130	Pass	
Ethylbenzene	%	99	70-130	Pass	
m&p-Xylenes	%	107	70-130	Pass	



Test	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Xylenes - Total	%	107		70-130	Pass	
<b>LCS - % Recovery</b>						
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions LM-LTM-ORG2010</b>						
TRH C6-C10	%	104		70-130	Pass	
TRH >C10-C16	%	98		70-130	Pass	
<b>LCS - % Recovery</b>						
<b>Polycyclic Aromatic Hydrocarbons USEPA 8270 Polycyclic Aromatic Hydrocarbons</b>						
Acenaphthene	%	89		70-130	Pass	
Acenaphthylene	%	91		70-130	Pass	
Anthracene	%	94		70-130	Pass	
Benz(a)anthracene	%	95		70-130	Pass	
Benzo(a)pyrene	%	116		70-130	Pass	
Benzo(b&j)fluoranthene	%	92		70-130	Pass	
Benzo(g,h,i)perylene	%	94		70-130	Pass	
Benzo(k)fluoranthene	%	99		70-130	Pass	
Chrysene	%	86		70-130	Pass	
Dibenz(a,h)anthracene	%	87		70-130	Pass	
Fluoranthene	%	91		70-130	Pass	
Fluorene	%	90		70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	99		70-130	Pass	
Naphthalene	%	85		70-130	Pass	
Phenanthrene	%	87		70-130	Pass	
Pyrene	%	86		70-130	Pass	
<b>LCS - % Recovery</b>						
<b>Organochlorine Pesticides USEPA 8081 Organochlorine Pesticides</b>						
4,4'-DDD	%	90		70-130	Pass	
4,4'-DDE	%	86		70-130	Pass	
4,4'-DDT	%	88		70-130	Pass	
a-BHC	%	88		70-130	Pass	
Aldrin	%	89		70-130	Pass	
b-BHC	%	108		70-130	Pass	
d-BHC	%	87		70-130	Pass	
Dieldrin	%	76		70-130	Pass	
Endosulfan I	%	88		70-130	Pass	
Endosulfan II	%	88		70-130	Pass	
Endosulfan sulphate	%	75		70-130	Pass	
Endrin	%	100		70-130	Pass	
Endrin aldehyde	%	75		70-130	Pass	
Endrin ketone	%	75		70-130	Pass	
g-BHC (Lindane)	%	88		70-130	Pass	
Heptachlor	%	94		70-130	Pass	
Heptachlor epoxide	%	82		70-130	Pass	
Hexachlorobenzene	%	102		70-130	Pass	
Methoxychlor	%	94		70-130	Pass	
<b>LCS - % Recovery</b>						
<b>Organophosphorous Pesticides USEPA 8141 Organophosphorus Pesticides</b>						
Diazinon	%	122		70-130	Pass	
Ethion	%	86		70-130	Pass	
Fenitrothion	%	90		70-130	Pass	
Methyl parathion	%	78		70-130	Pass	
Mevinphos	%	86		70-130	Pass	
<b>LCS - % Recovery</b>						
<b>Metals M8 USEPA 6010/6020 Heavy Metals &amp; USEPA 7470/71 Mercury</b>						



Test				Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Arsenic				%	80		80-120	Pass	
Cadmium				%	91		80-120	Pass	
Chromium				%	95		80-120	Pass	
Copper				%	97		80-120	Pass	
Lead				%	96		80-120	Pass	
Mercury				%	104		75-125	Pass	
Nickel				%	96		80-120	Pass	
Zinc				%	96		80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Spike - % Recovery</b>									
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>					Result 1				
TRH C6-C9	M13-JI06975	CP	%	104			70-130	Pass	
TRH C10-C14	M13-JI06836	NCP	%	95			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>BTEX</b>					Result 1				
Benzene	M13-JI06975	CP	%	104			70-130	Pass	
Toluene	M13-JI06975	CP	%	98			70-130	Pass	
Ethylbenzene	M13-JI06975	CP	%	99			70-130	Pass	
o-Xylene	M13-JI06975	CP	%	107			70-130	Pass	
m&p-Xylenes	M13-JI06975	CP	%	107			70-130	Pass	
Xylenes - Total	M13-JI06975	CP	%	107			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>					Result 1				
TRH C6-C10	M13-JI06975	CP	%	104			70-130	Pass	
TRH >C10-C16	M13-JI06836	NCP	%	93			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Polycyclic Aromatic Hydrocarbons</b>					Result 1				
Acenaphthene	M13-JI06975	CP	%	91			70-130	Pass	
Acenaphthylene	M13-JI06975	CP	%	93			70-130	Pass	
Anthracene	M13-JI06975	CP	%	94			70-130	Pass	
Benz(a)anthracene	M13-JI06975	CP	%	93			70-130	Pass	
Benzo(a)pyrene	M13-JI06975	CP	%	117			70-130	Pass	
Benzo(b&j)fluoranthene	M13-JI06975	CP	%	83			70-130	Pass	
Benzo(g,h,i)perylene	M13-JI06975	CP	%	90			70-130	Pass	
Benzo(k)fluoranthene	M13-JI06975	CP	%	94			70-130	Pass	
Chrysene	M13-JI06975	CP	%	89			70-130	Pass	
Dibenz(a,h)anthracene	M13-JI06975	CP	%	88			70-130	Pass	
Fluoranthene	M13-JI06975	CP	%	93			70-130	Pass	
Fluorene	M13-JI06975	CP	%	90			70-130	Pass	
Indeno(1,2,3-cd)pyrene	M13-JI06975	CP	%	92			70-130	Pass	
Naphthalene	M13-JI06975	CP	%	87			70-130	Pass	
Phenanthrene	M13-JI06975	CP	%	90			70-130	Pass	
Pyrene	M13-JI06975	CP	%	89			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Organochlorine Pesticides</b>					Result 1				
4,4'-DDD	A13-JI08215	NCP	%	82			70-130	Pass	
4,4'-DDE	A13-JI08215	NCP	%	82			70-130	Pass	
4,4'-DDT	A13-JI08215	NCP	%	77			70-130	Pass	
a-BHC	A13-JI08215	NCP	%	81			70-130	Pass	
Aldrin	A13-JI08215	NCP	%	86			70-130	Pass	
b-BHC	A13-JI08215	NCP	%	99			70-130	Pass	
d-BHC	A13-JI08215	NCP	%	75			70-130	Pass	
Dieldrin	A13-JI08215	NCP	%	72			70-130	Pass	
Endosulfan I	A13-JI08215	NCP	%	80			70-130	Pass	



Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan II	A13-JI08215	NCP	%	74			70-130	Pass	
Endosulfan sulphate	A13-JI08215	NCP	%	75			70-130	Pass	
Endrin	A13-JI08215	NCP	%	74			70-130	Pass	
Endrin aldehyde	A13-JI08215	NCP	%	76			70-130	Pass	
Endrin ketone	A13-JI08215	NCP	%	117			70-130	Pass	
g-BHC (Lindane)	A13-JI08215	NCP	%	83			70-130	Pass	
Heptachlor	A13-JI08215	NCP	%	85			70-130	Pass	
Heptachlor epoxide	A13-JI08215	NCP	%	77			70-130	Pass	
Hexachlorobenzene	A13-JI08215	NCP	%	96			70-130	Pass	
Methoxychlor	A13-JI08215	NCP	%	71			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Organophosphorous Pesticides</b>				Result 1					
Diazinon	M13-JI06960	NCP	%	118			70-130	Pass	
Ethion	M13-JI06960	NCP	%	95			70-130	Pass	
Fenitrothion	M13-JI06960	NCP	%	101			70-130	Pass	
Methyl parathion	M13-JI06960	NCP	%	88			70-130	Pass	
Mevinphos	M13-JI06960	NCP	%	93			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Metals M8</b>				Result 1					
Arsenic	M13-JI06960	NCP	%	75			75-125	Pass	
Cadmium	M13-JI06975	CP	%	83			75-125	Pass	
Chromium	M13-JI06975	CP	%	100			75-125	Pass	
Copper	M13-JI06975	CP	%	94			75-125	Pass	
Lead	M13-JI06975	CP	%	90			75-125	Pass	
Mercury	M13-JI06975	CP	%	98			70-130	Pass	
Nickel	M13-JI06975	CP	%	83			75-125	Pass	
Zinc	M13-JI06975	CP	%	88			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Duplicate</b>									
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				Result 1	Result 2	RPD			
TRH C6-C9	M13-JI06975	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M13-JI06836	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M13-JI06836	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M13-JI06836	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
<b>Duplicate</b>									
<b>BTEX</b>				Result 1	Result-2	RPD			
Benzene	M13-JI06975	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M13-JI06975	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M13-JI06975	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
o-Xylene	M13-JI06975	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M13-JI06975	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Xylenes - Total	M13-JI06975	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
<b>Duplicate</b>									
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1	Result 2	RPD			
Naphthalene	M13-JI06975	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M13-JI06975	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M13-JI06836	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M13-JI06836	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M13-JI06836	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
<b>Duplicate</b>									
<b>Polycyclic Aromatic Hydrocarbons</b>				Result 1	Result 2	RPD			
Acenaphthene	M13-JI10054	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M13-JI10054	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M13-JI10054	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	



Duplicate				Result 1	Result 2	RPD		
<b>Polycyclic Aromatic Hydrocarbons</b>								
Benz(a)anthracene	M13-JI10054	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(a)pyrene	M13-JI10054	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(b&j)fluoranthene	M13-JI10054	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(g,h,i)perylene	M13-JI10054	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(k)fluoranthene	M13-JI10054	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chrysene	M13-JI10054	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibenz(a,h)anthracene	M13-JI10054	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	M13-JI10054	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluorene	M13-JI10054	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	M13-JI10054	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Naphthalene	M13-JI10054	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phenanthrene	M13-JI10054	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pyrene	M13-JI10054	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
<b>Duplicate</b>								
<b>Organochlorine Pesticides</b>				Result 1	Result 2	RPD		
4,4'-DDD	A13-JI08215	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDE	A13-JI08215	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDT	A13-JI08215	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
a-BHC	A13-JI08215	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Aldrin	A13-JI08215	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
b-BHC	A13-JI08215	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Chlordane	A13-JI08215	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
d-BHC	A13-JI08215	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Dieldrin	A13-JI08215	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan I	A13-JI08215	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan II	A13-JI08215	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan sulphate	A13-JI08215	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin	A13-JI08215	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin aldehyde	A13-JI08215	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin ketone	A13-JI08215	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
g-BHC (Lindane)	A13-JI08215	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor	A13-JI08215	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor epoxide	A13-JI08215	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Hexachlorobenzene	A13-JI08215	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Methoxychlor	A13-JI08215	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Toxaphene	A13-JI08215	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
<b>Duplicate</b>								
<b>Organophosphorous Pesticides</b>				Result 1	Result 2	RPD		
Bolstar	M13-JI06960	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Chlorpyrifos	M13-JI06960	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Demeton-O	M13-JI06960	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Diazinon	M13-JI06960	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Dichlorvos	M13-JI06960	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Disulfoton	M13-JI06960	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ethion	M13-JI06960	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ethoprop	M13-JI06960	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fenitrothion	M13-JI06960	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fensulfothion	M13-JI06960	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fenthion	M13-JI06960	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Merphos	M13-JI06960	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Methyl azinphos	M13-JI06960	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Methyl parathion	M13-JI06960	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Mevinphos	M13-JI06960	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Naled	M13-JI06960	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass



Duplicate								
Organophosphorous Pesticides				Result 1	Result 2	RPD		
Phorate	M13-JI06960	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ronnel	M13-JI06960	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Tokuthion	M13-JI06960	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Trichloronate	M13-JI06960	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Duplicate								
Metals M8				Result 1	Result 2	RPD		
Arsenic	M13-JI06975	CP	mg/kg	4.0	3.1	27	30%	Pass
Cadmium	M13-JI06975	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M13-JI06975	CP	mg/kg	12	11	6.0	30%	Pass
Copper	M13-JI06975	CP	mg/kg	< 5	< 5	<1	30%	Pass
Lead	M13-JI06975	CP	mg/kg	10	8.7	17	30%	Pass
Mercury	M13-JI06975	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	M13-JI06975	CP	mg/kg	< 5	< 5	<1	30%	Pass
Zinc	M13-JI06975	CP	mg/kg	7.8	9.7	23	30%	Pass



**Comments**

Asbestos was analysed by LRM Global. NATA accreditation number 15684. Job number 9950.000, batch number B7652.

**Sample Integrity**

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

**Qualifier Codes/Comments**

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note.- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

**Authorised By**

Tammy Lakeland	Client Services
Carroll Lee	Senior Analyst-Volatile (VIC)
Emily Rosenberg	Senior Analyst-Metal (VIC)
Stacey Jenkins	Senior Analyst-Organic (VIC)


**Glenn Jackson**
**Laboratory Manager**
**Final report - This Report replaces any previously issued Report**

- Indicates Not Requested

\* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

**Company Name:** Coffey Environments Pty Ltd ACT  
**Address:** 16 Mildura Street  
 Fyshwick  
 ACT 2609  
  
**Client Job No.:** GEOTFYSH09656AA

**Order No.:**  
**Report #:** 385457  
**Phone:** +61 2 6260 7288  
**Fax:** +61 2 6260 7211

**Received:** Jul 9, 2013 9:04 AM  
**Due:** Jul 16, 2013  
**Priority:** 5 Day  
**Contact Name:** Nick Davison

**Eurofins | mgt Client Manager: Tammy Lakeland**

Sample Detail					% Moisture	Asbestos	HOLD	Metals M8	Eurofins   mgt Suite 10
<b>Laboratory where analysis is conducted</b>									
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>					X		X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>									
<b>Brisbane Laboratory - NATA Site # 20794</b>									
<b>External Laboratory</b>						X			
Sample ID	Sample Date	Sampling Time	Matrix	LAB ID					
TP1-1	Jul 05, 2013		Soil	M13-JI06975	X	X			X
TP2-1	Jul 05, 2013		Soil	M13-JI06976	X	X		X	
TP3-1	Jul 05, 2013		Soil	M13-JI06977	X	X			X
TP3-2	Jul 05, 2013		Soil	M13-JI06978	X	X			X
TP4-1	Jul 05, 2013		Soil	M13-JI06979	X	X		X	
TP5-1	Jul 05, 2013		Soil	M13-JI06980	X	X			X
TP1-2	Jul 05, 2013		Soil	M13-JI06981			X		
TP2-2	Jul 05, 2013		Soil	M13-JI06982			X		
TP3-3	Jul 05, 2013		Soil	M13-JI06983			X		
TP4-2	Jul 05, 2013		Soil	M13-JI06984			X		



<b>Company Name:</b>	Coffey Environments Pty Ltd ACT	<b>Order No.:</b>		<b>Received:</b>	Jul 9, 2013 9:04 AM
<b>Address:</b>	16 Mildura Street Fyshwick ACT 2609	<b>Report #:</b>	385457	<b>Due:</b>	Jul 16, 2013
<b>Client Job No.:</b>	GEOTFYSH09656AA	<b>Phone:</b>	+61 2 6260 7288	<b>Priority:</b>	5 Day
		<b>Fax:</b>	+61 2 6260 7211	<b>Contact Name:</b>	Nick Davison

**Eurofins | mgt Client Manager: Tammy Lakeland**

Sample Detail					% Moisture	Asbestos	HOLD	Metals M8	Eurofins   mgt Suite 10
<b>Laboratory where analysis is conducted</b>									
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>					X		X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>									
<b>Brisbane Laboratory - NATA Site # 20794</b>									
<b>External Laboratory</b>						X			
TP5-2	Jul 05, 2013		Soil	M13-JI06985			X		

## Sample Receipt Advice

Company name: **Coffey Environments Pty Ltd ACT**  
 Contact name: **Nick Davison**  
 Client job number: **GEOTFYSH09656AA**  
 COC number: **5626**  
 Turn around time: **5 Day**  
 Date/Time received: **Jul 9, 2013 9:04 AM**  
 Eurofins | mgt reference: **385457**

### Sample information

- A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 9.4 degrees Celsius.
- All samples have been received as described on the above COC.
- COC has been completed correctly.
- Attempt to chill was evident.
- Appropriately preserved sample containers have been used.
- All samples were received in good condition.
- Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- Organic samples had Teflon liners.
- Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

### Contact notes

If you have any questions with respect to these samples please contact:

Tammy Lakeland on Phone : (+61) (3) 8564 5000 or by e.mail:  
 TammyLakeland@eurofins.com.au

Results will be delivered electronically via e.mail to Nick Davison - nick\_davison@coffey.com.

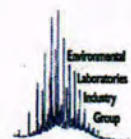
### Eurofins | mgt Sample Receipt



Environmental Laboratory  
 Air Analysis  
 Water Analysis  
 Soil Contamination Analysis

NATA Accreditation  
 Stack Emission Sampling & Analysis  
 Trade Waste Sampling & Analysis  
 Groundwater Sampling & Analysis

38 Years of Environmental Analysis & Experience







Chain of Custody

No: 05626

Laboratory Quotation / Order No:

Job No: GEOTFYSH09656AA Sheet 1 of 1

Dispatch to: EUROFINs MLT  
(Address & Phone No.) 2 KINGSTON TOWN CLOSE  
OAKVELLH VIC 3166

Sampled by: S B.

Consigning Officer: N. DAVISON

Date Dispatched: 8/7/13

Attention: TAMMY LAKELAND.

Project Manager: ND  
(report results to) nick.davison@coffey.com

Courier Service: TOLL PRIORITY.

Consignment Note No:

Relinquished by: N DAVISON

Date:	Time:	Received by:	Date:	Time:
8/7/13	1400.	Catherine	9/7	9:04 am

Comments	Sample Matrix	Container Type and Preservative	Sample No.	Date Sampled	Analyses Required								Sample Condition on Receipt	
					PAHs	TPHs	MAHs = BTEX	Metals:	BIO	ASBESTOS	MB	HOLD		
	SOIL	1x 125mL (G) JAR	GF9656AA	5/7/13						✓	✓			
	"	"	TP1-2	"										
	"	"	TP2-1	"							✓			
	"	"	TP2-2	"							✓			
	"	"	TP3-1	"						✓	✓			
	"	"	TP3-2	"						✓	✓			
	"	"	TP3-3	"										
	"	"	TP4-1	"							✓	✓		
	"	"	TP4-2	"								✓		
	"	"	TP5-1	"						✓	✓			
	"	"	TP5-2	"								✓		

Special Laboratory Instructions: BIO - TEL/BTEX/PAH/OCP/OPP/As, Cd, Cr, Cu, Ni, Pb, Zn, Hg  
MB - As, Cd, Cr, Cu, Ni, Pb, Zn, Hg  
Turnaround Required: STD

Detection Limits: STD  
Copies: WHITE: Sign on release. YELLOW: If dispatched to interstate Lab, Lab to sign on receipt and fax back to Coffey. BLUE: To be returned with results.

JOB NUMBER MUST BE REFERENCED ON ALL SUBSEQUENT PAGES

385457